Stream Maintenance Program Update

Final Subsequent Environmental Impact Report
Volume 2

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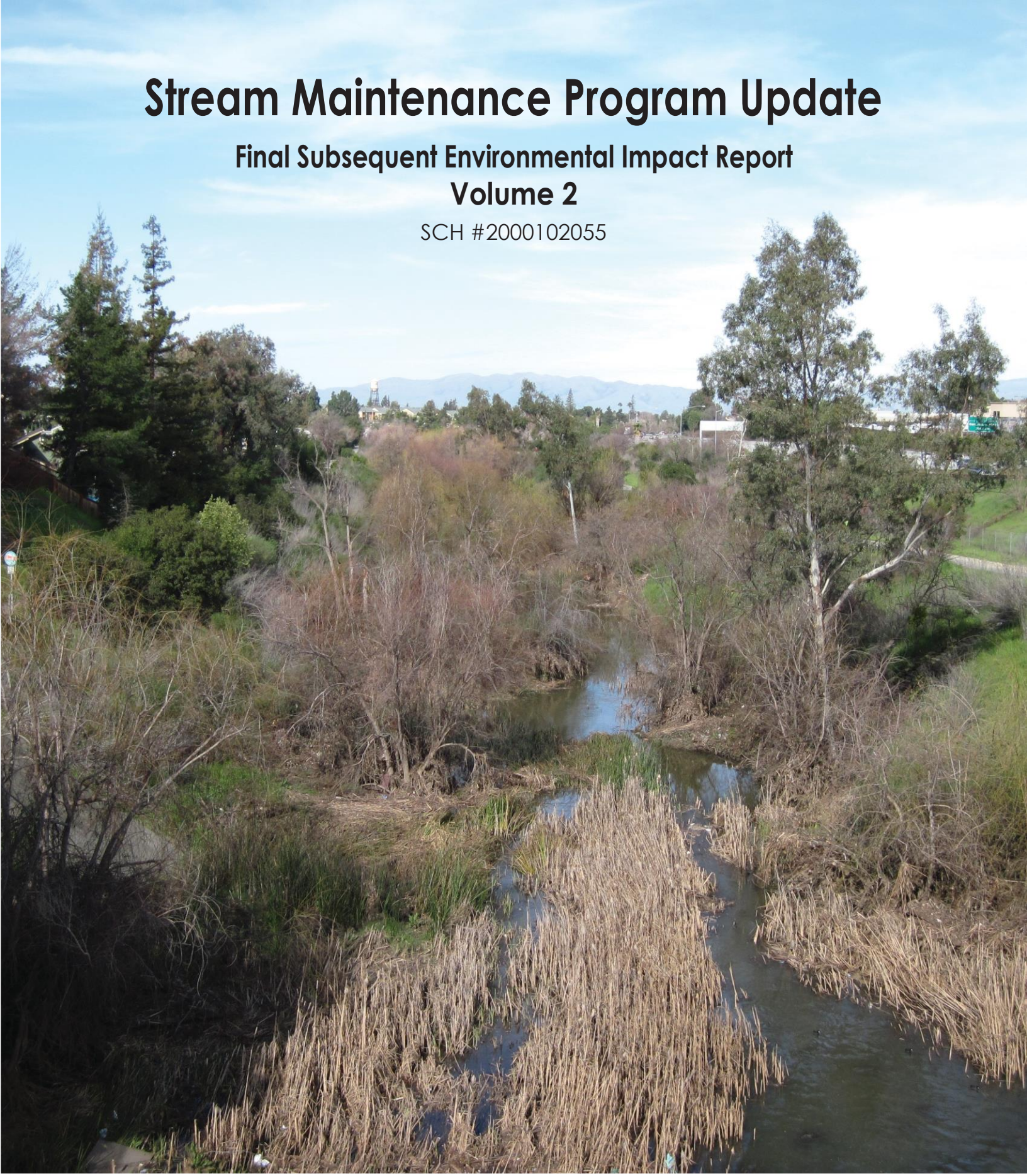

Santa Clara Valley Water District

December 2011

Horizon WATER and ENVIRONMENT

Santa Clara Valley Water District

FINAL
SUBSEQUENT ENVIRONMENTAL IMPACT REPORT

Santa Clara Valley Water District

Stream Maintenance Program Update

2012–2022

Volume II of II

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ACRONYMS

AB	Assembly Bill
ACHP	Advisory Council on Historic Preservation
ADA	Americans with Disabilities Act
AG	Attorney General
AIS	Aerial Information Systems, Inc.
APE	area of potential effects
B.P.	Before Present
BAAQMD	Bay Area Air Quality Management District
BCDC	San Francisco Bay Conservation and Development Commission
BMP	Best Management Practice
BO	Biological Opinion
CAA	Clean Air Act
CAAQSs	California Ambient Air Quality Standards
CAC	County Agricultural Commissioner
Cal/OSHA	California Occupational Safety and Health Administration
CalRecycle	California Department of Resources Recycling and Recovery Agency
Caltrans	California Department of Transportation
CARB	California Air Resources Board
CCC	Central California Coast
CCR	California Code of Regulations
CDFG or DFG	California Department of Fish and Game
CDPR	California Department of Pesticide Regulation
CEQA	California Environmental Quality Act
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CESA	California Endangered Species Act
CFR	Code of Federal Regulations
cfs	cubic feet per second
CH_4	methane
CHRIS	California Historical Resources Information System
CIP	capital improvement program
CIWMB	California Integrated Waste Management Board
CIWMP	Countywide Integrated Waste Management Plan
CMP	Congestion Management Program
CNDDB	California Natural Diversity Database
CNEL	community noise equivalent level
CNPS	California Native Plant Society
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalents
County	Santa Clara County
CRHR	California Register of Historic Resources
CVC	California Vehicle Code
CWA	Clean Water Act
CWHR	California Wildlife Habitat Relationships

cy	cubic yards
dB	decibel
dBA	A-weighted decibel
dbh	diameter at breast height
DDD	dichlorodiphenyldichloroethane
DDE	dichlorodiphenyldichloroethylene
DDT	dichlorodiphenyltrichloroethane
DEH	Santa Clara County Department of Environmental Health
DO	dissolved oxygen
DOT	U.S. Department of Transportation
DEIR	Draft Environmental Impact Report
DSEIR	Draft Subsequent Environmental Impact Report
DTSC	California Department of Toxic Substances Control
DWR	California Department of Water Resources
EA	Environmental Assessment
EFH	Essential Fish Habitat
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
EMT	Early Period/Middle Period Transition
FEIR	Final Environmental Impact Report
FESA	Federal Endangered Species Act
FHWA	Federal Highway Administration
FIFRA	Federal Insecticide, Rodenticide, and Fungicide Act
FTA	Federal Transit Administration
FSEIR	Final Subsequent Environmental Impact Report
FY	fiscal year
GHG	greenhouse gas
HFC	hydrofluorocarbons
Hg	mercury
HCP	habitat conservation plan
HMMP	Habitat Mitigation and Management Plan
HMP	hydromodification plan
HOV	high occupancy vehicle
IAWG	Inter-Agency Work Group
IPCC	Intergovernmental Panel on Climate Change
IPMP	Invasive plant management program
ISA	International Society of Arboriculture
ISP	Invasive Spartina Program
LCFS	Low Carbon Fuel Standard
L_{dn}	day-night (sound) level
L_{eq}	equivalent sound level
L_{max}	maximum sound level
L_{min}	minimum sound level
LOS	level of service
LRA	local responsibility area
LUFT	leaking underground fuel tank
L_{xx}	percentile-exceeded sound level
MeHg	methylmercury

MFA	mitigation feasibility assessment
mg/L	milligrams per liter
MHW	mean high water
MTBA	Migratory Bird Treaty Act
MTC	Metropolitan Transportation Commission
N_2O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NCCP	natural community conservation plan
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NOP	Notice of Preparation
NOx	nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
NPW	~~Notification~~Notice of Proposed Work
NRHP	National Register of Historic Places
OHP	California Office of Historic Preservation
PAHs	polycyclic aromatic hydrocarbons
PCBs	Polychlorinated biphenyls
PCEs	primary constituent elements
PCR	Post-Construction Report
PM	particulate matter
PM_{10}	particulate matter less than 10 microns in diameter
$PM_{2.5}$	particulate matter less than 2.5 microns in diameter
Porter-Cologne Act	Porter-Cologne Water Quality Control Act
PRC	California Public Resources Code
PRESCRIBE	Pesticide Regulation's Endangered Species Realtime Internet Bulletin Engine database
Proposed Project	Stream Maintenance Program Update
RCRA	Resource Conservation and Recovery Act
ROG	reactive organic gases
RWQCB	Regional Water Quality Control Board
SB	Senate Bill
SCCC	South-Central California Coast
SCCVCD	Santa Clara County Vector Control District
SCS	Soil Conservation Service (now the Natural Resources Conservation Service)
SCVURPPP	Santa Clara Valley Urban Runoff Pollution Prevention Program
SCVWD	Santa Clara Valley Water District
SEIR	Subsequent Environmental Impact Report
SFBAAB	San Francisco Bay Area Air Basin
SHPO	State Historic Preservation Officer
SMP	Stream Maintenance Program
SR	State Route
SWRCB	State Water Resources Control Board
TMDL	Total Maximum Daily Load
URMP	Urban Runoff Management Plan
U/S	upstream

USACE	U.S. Army Corps of Engineers
USC	U.S. Code
USEPA	U.S. Environmental Protection Agency
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geologic Survey
USSCS	U.S. Soil Conservation Service, now known as U.S. Natural Resources Conservation Service (NRCS)
VMT	vehicle miles traveled
VTA	(Santa Clara) Valley Transportation Authority
WDRs	waste discharge requirements
WMA	watershed management area
WPCP	water pollution control plant

GLOSSARY OF SIGNIFICANT TERMS

1 percent flood	Refers to a flood of a magnitude that has an estimated probability of 1 in 100 of occurring in any given year. Technically more precise way of referring to the "100-year flood." Generally, 1 percent, 2 percent, and 10 percent events refer to levels of flood flows with an expected recurrence of 100, 50, and 10 years, respectively.
100-Year Flood	Flood of a magnitude with an expected recurrence of once in 100 years. Synonymous with 1 percent flood.
Adaptive Management	A dynamic process that recognizes that the future cannot be perfectly predicted. In response to imperfect predictions, planning and management strategies are modified as better information becomes available. It is a continuous improvement process whereby monitoring and analysis of the results of past actions are fed back into the current decision-making process.
Aggradation	Process of a channel raising its elevation through deposition of sediments. A type of fluvial geomorphic instability (see "Degradation").
Anadromous	A term used to describe the movement of certain fishes from saltwater to freshwater to breed, and from freshwater to saltwater to grow and mature.
Annual Plant	A plant that completes its life cycle and dies in one growing season or one year (e.g., corn, lettuce, wild oat).
Annual Work Plan	The stream maintenance work indentified that forms the basis of the annual budget. Specific information, such as location and size of sediment removal, vegetation management and erosion repair, is provided in the Annual Work Plan.
Appurtenant Structures	Accessory structures, such as storm outfalls, stream gages, trash racks, flap gates, tide gates, vaults, and headwalls.
Aquatic Vegetation	Herbaceous vegetation that grows in the wetted channel bottom and is typically dependent on either sustained flow or prolonged periods of water on site for survival.
Avian	Bird or bird-like.
Avoidance	Strategies for the planning, design, maintenance, and operation of District facilities to provide water supply and flood control, and which refrain from causing significant adverse environmental impacts.

Bank Stabilization	Bank stabilization involves any action by the District to stream banks that are eroding (repair), as well as preventative erosion protection. The District implements stream bank stabilization when the problem (1) causes or could cause significant damage to a property or adjacent property, (2) is a public safety concern, (3) negatively affects transportation or recreational use, (4) negatively affects water quality, or (5) negatively affects riparian habitat. Bank protection stabilizes a channel bank by using rock, rip rap, concrete, soft materials, vegetation, or a combination of materials or methods. Bank stabilization can also include preventative maintenance to ensure that banks do not erode in the future. This new work is considered routine maintenance because it is either restoring the flood control function of a modified channel, or it is repairing a natural bank to its approximate condition prior to becoming an erosion problem.
Bank/Bench	The area of the bank above the bankfull elevation and below the toe of levee inboard if in a reach with levee, and property line if not in a levee reach.
Bank Repair	Maintenance of existing bank stabilization structures with in-kind, in-place materials. This type of maintenance occurs when such structures fail.
Bankfull	When the channel is flowing full, the water surface is at floodplain level and the flow rate is the bankfull discharge.
Bankfull Bank	The area of bank between instream and bankfull elevation
Bankfull Elevation	The point where the normal channel meets the floodplain, the elevation at the top of the channel banks. When the channel is flowing full, the water surface is at floodplain level and the flow rate is the bankfull discharge.
Basin	For the purposes of the Stream Maintenance Program, a depression or valley that drains to a common waterbody. In Santa Clara County, two major hydrologic basins drain either into San Francisco or to Monterey Bay. In the northern portion of the county, streams of the Santa Clara Basin drain to San Francisco Bay. To the south, streams in the Pajaro River Basin drain ultimately to Monterey Bay.
Bedload	Material moving on or within a few particle diameters above the streambed, rolling or sliding, but not carried in the water column itself. Generally moves more slowly than the streamflow itself. Compare with “Suspended Sediment.” Bedload does not mean the rate of discharge of bed material (see “Bedload Discharge”).

Bedload Discharge	The rate of bedload transport; the quantity of bedload passing a point on the channel in a unit of time.
Best Management Practice (BMP)	An activity, procedure, or other standard management and work practice that provides the most effective means of preventing or reducing pollution or other negative environmental consequences. BMPs are incorporated into project activities to avoid and minimize environmental impacts.
Biotechnical	A method of bank stabilization emphasizing the incorporation of soft structures (e.g., vegetation). See "Soft Structures."
Biotechnical Channel	A natural or artificial waterway that periodically or continuously contains moving water, or which forms a connecting link between two bodies of water.
Brackish Water	Water that is a mixture of freshwater and saltwater, with a salinity less than seawater.
Bypass Channel	A flood control facility through which a portion of a stream's flow is diverted from one point and reintroduced into the stream at the downstream end of the bypass channel. Bypass channels can be used during the construction or maintenance process. Permanent bypass channels can also be designed to accommodate flood flows.
Bypass Structures	On construction sites, a generic term for any type of structure(s) used to pond water and convey it around a work site (e.g., cofferdams, bypass pipes, channels).
California Environmental Quality Act (CEQA)	The California Environmental Quality Act is California Public Resources Code Sections 21000 et seq. CEQA establishes a duty for public agencies to avoid or minimize environmental damage where feasible, recognizing that a public agency has an obligation to balance a variety of public objectives, including economic, environmental, and social factors. CEQA is intended to facilitate the disclosure of the significant environmental effects of proposed activities to decision-makers and the public, the identification of ways to avoid or reduce environmental damage, and the prevention of environmental damage by requiring the implementation of feasible alternatives or mitigation measures.
Capital Improvement Project CIP)	For the purposes of the Stream Maintenance Program, a large flood control construction project that affects the flood conveyance capacity of the stream. These projects are not considered routine stream maintenance.
Channel	Creeks and canals.

Channel Erosion	Includes the processes of streambank erosion, streambed scour, and degradation.
Channel Stabilization	See "Bank Stabilization."
Clean Water Act	A broad federal statute with the goal of maintaining and restoring waters of the U.S. (see "Waters of the United States"). Federal Water Pollution Control Act.
Co-dominance	Equal in size and relative importance, usually associated with either the trunk/stems or scaffold limbs/branches in the crown (Matheny and Clark 1994).
Compensatory Mitigation	The restoration, creation, enhancement, or preservation of wetlands and other resources expressly for the purpose of compensating for unavoidable adverse impacts that remain after all appropriate and practicable avoidance and minimization of impacts have been achieved in compliance with law or requirements of regulatory agencies. (Federal Register March 6, 1995, Federal Guidance for the Establishment, Use and Operation of Mitigation Banks). In the Stream Maintenance Program, compensatory mitigation is mitigation in perpetuity that is to be provided by SCVWD to offset significant residual impacts that cannot be avoided.
Confluence	A meeting of two or more streams or rivers.
Culvert	Any covered structure not classified as a bridge, which conveys a waterway under a road or other paved area.
Cut-Stump Treatment	Elimination of woody vegetation by cutting at ground level and treating the cambium, or outer most plant tissue, with a concentrated, systemic herbicide. Best results are obtained when application of herbicide immediately follows (within minutes) the removal of target vegetation. Trees removed and treated by cut stump are reported as hand removal.
Debris Basin	A depression formed by the construction of a barrier or dam built at a suitable location to retain rock, sediment, plant material, and the like, which can be conveyed along steep hillside streams during high flows. Usually placed in hillside areas where access is better for removing sediment, generally prior to entering urbanized reaches (see also "Sediment Basin").
Degradation	Process of a channel lowering its elevation through increased erosion, channel bed scour, or down-cutting. A type of fluvial geomorphic instability (see "Aggradation").
Depauperate	An ecosystem that lacks sufficient stored chemical elements required for life. Depauperate ecosystems cannot support rapid growth of flora and fauna, high biomass density, or high biological diversity.

Design Capacity An engineering term used to describe the amount of water that a modified channel was designed to convey. Generally, the design capacity for improved SCVWD facilities is to accommodate the 1 percent or 100-year flood. This is the level of protection. Capacity is in cfs or Q (see "Flood Capacity").

Design Flood The maximum calculated discharge intended to be conveyed in the design of a capacity-constructed channel. The maximum level of flood protection used as a design criterion in the design of a constructed or improved channel or waterway.

Diameter at Breast Height (dbh) A tree trunk diameter is measured by the standard diameter at breast height (dbh) or approximately 4.5 feet above ground level.

Drop Structure A structure designed to convey flows over a vertical distance from a higher to a lower elevation.

Emergency A situation is considered an "emergency" if it is a sudden, unexpected occurrence involving a clear and imminent danger that demands immediate action to prevent or mitigate loss of or damage to life, health, property, or essential public services (Public Resource Code Section 21060.3). Emergency repair or activities associated with an emergency are not addressed by the Stream Maintenance Program. Most emergency projects are exempt from review pursuant to CEQA (Public Resource Code Section 21080(b)(2), (3), (4)), although there may be post-permitting requirements.

Environmental Impact Report (EIR) A detailed statement prepared under CEQA describing and analyzing the significant environmental impacts of a project and discussing ways to mitigate or avoid the effects (see also "Program Environmental Impact Report").

Ephemeral Creek that only flows for short periods of time during or immediately following a rain event.

Erosion The detachment and movement of soil and rock fragments by water and other geological agents, which results in the wearing away of the land. When water is the eroding agent, erosional processes include sheet and rill erosion, gully erosion, and channel erosion.

Fish Ladders Artificial, stepped pools to enable fish traveling upstream, against the flow of water, to span a large vertical distance in a series of gradual steps. Used at dams or other in-stream barriers.

Flood Capacity	The capacity of a channel to carry calculated flood flows. Capacity is dependent on cross-sectional area and frictional components (e.g., channel vegetation).
Flood Control Facility	For the purposes of the Stream Maintenance Program, any watercourse, whether natural or man-made, in which water does or may flow and which is under ownership or controlled by the District for flood control purposes.
Fluvial	Pertaining to rivers.
Follow-up Hand Removal	Generally this category of work is removal of dead vegetative material after herbicide application. This work is not reported.
Gabion Basket or Mattress	Galvanized wire mesh panels filled with rock used for structural purposes. They can be connected together and used for retaining walls, revetments, or bank stabilization.
Geomorphology	The study of the forms of the earth's surface and the processes that shape them. Fluvial geomorphology involves the study of streams and sediment processes: transport, erosion, storage, and deposition.
Gradeall	A multipurpose mobile excavation machine with a reach of 35 feet.
Habitat	The specific area or environment in which a particular type of plant or animal lives. To be complete, an organism's habitat must provide all of the basic requirements of life for that organism.
Habitat Conservation Plan (HCP)	Plans under the Endangered Species Act (ESA) negotiated between the federal government and private landowners or state and local governments. These plans are designed to allow landowners to receive a federal permit to unintentionally harm listed species in the course of completing projects. In exchange for a permit, landowners agree to pursue specific management protections for threatened and endangered species.
Hard Structures	A type of bank stabilization structure incorporating rock, rip rap, sack concrete, gabion baskets and mattresses, or concrete. These structures are inert and rigid.
Hardscape	Concrete, rock, gabions, or other permanent, hard surface channel treatment. Refers to designs that utilize predominantly hard structures and are generally incapable of supporting vegetation (see "Softscape," "Hybrid" and bank stabilization table).
Hazard Tree	The combination of a failure of a tree or part of a tree with the presence of an adjacent target. A hazard does not exist if

	there will not be an impacted target. Excluded from SMP coverage.
Headwaters	The minor drainages in the extreme upper watershed.
Herbaceous Vegetation	Non-woody vegetation which includes grasses, broadleaf weeds, cattails, bulrushes, annuals, biennials, and perennials.
Herbicide	A chemical agent used to destroy or inhibit plant growth.
Hybrid	For purposes of the SMP Update, refers to bank stabilization projects that consist of a combination of hard and softscape (see "Hardscape," "Softscape," and bank stabilization table).
Hydraulic	Of or pertaining to the scientific or technical study of the static and dynamic behavior of fluids. Fluvial hydraulics is an engineering discipline geared toward the physics of water flow in channels—its volume, velocity, and elevation, in space and time. Hydraulic analysis is typically used to determine discharge capacity and to assess the effects of channel vegetation on channel capacity.
Hydrologic Basin	For the purposes of the Stream Maintenance Program, a depression or valley that drains to a common waterbody. In Santa Clara County, there are two major hydrologic basins draining either into San Francisco Bay or to Monterey Bay. In the northern portion of the county, streams of the Santa Clara Basin drain to San Francisco Bay. To the south, streams in the Pajaro River Basin drain ultimately to Monterey Bay. Each basin is comprised of several watersheds.
Hydrology	Hydrology is the science (or study) of water in the natural environment with a focus on the circulation and distribution of water as expressed in the hydrologic cycle or water balance.
Hydroseed	A process for revegetation of large areas. Plant seed, fertilizer, straw mulch, a binding agent, and green dye are mixed in a truck-mounted tank and sprayed through a hose onto the bare ground.
Impact	See "Significant Environmental Impact."
Impervious Hardscape	Paved areas such as streets and sidewalks, other developed areas, or bank stabilization methods which are impenetrable to water.
Implementation Measure	An implementation measure is an action, procedure, program, or technique that carries out policy. Implementation measures provide specific guidance to District managers and staff in the environmental review and processing of routine stream maintenance projects.

Inlet	An arrangement for conveying surface water into an underdrain, pipe, culvert, or channel.
Inoperable Canals	Canals that were historically, but are not currently, used to convey water for water supply purposes. Although inoperable, these canals typically convey storm and non-storm runoff entering from upslope locations. In general, these canals are unvegetated and do not support beneficial uses. However, pockets of wetland-associated or riparian vegetation exist in certain locations. Sediment removal, vegetation management, and bank stabilization activities in canals resulting in impacts to such vegetation (e.g., sediment removal that also results in removal of the associated vegetation) would require compensatory mitigation, consistent with the District's mitigation program.
Instream	For the purposes of the SMP Update, inboard levee toe to the opposite inboard levee toe. Where there is not a levee, inboard toe of the stream, ordinarily associated with "channel bottom" (see "bankfull bank").
Invasive Plant	An invasive plant species reproduces rapidly and has the ability to spread aggressively outside its natural range, since the normal pressures of disease and predation which typically keep a populations growth in check are not present. Invasive plant species may alter ecological processes such as pollination patterns, nutrient cycling, fire regimes and modify canopy architecture causing a loss of cover, nesting and foraging habitat for wildlife species. Aggressive growth patterns often outcompete with native plant species. An invasive plant may be native or non-native. Non-native invasive plants are typically of greatest concern in native ecosystems.
Invasive Species	A subcategory of non-native plants that aggressively invades natural plant communities and displaces native plants or less aggressive weedy plants. Two examples of invasive species in Santa Clara County wetland and riparian areas are broad-leaf peppergrass (*Lepidium latifolium*) and giant reed (*Arundo donax*).
Invert	The lowest point of the internal cross section of a pipe, culvert, or channel; the elevation of the bottom of the channel (see "instream").
Lacustrine	Of or pertaining to a lake.
Lateral Branch	A secondary or subordinate branch arising from a larger limb or trunk (Harris et al. 2004).
Levee	An embankment constructed to prevent a river or stream from flooding adjacent lands.

Levee Inboard	Area of levee between inboard toe and inboard edge of levee top. Generally the inboard levee slope.
Levee Outboard	Area of levee between outboard edge of levee top and outboard toe of levee. Generally the outboard levee slope.
Levee Top	Area of levee between top of levee inboard and levee outboard. Generally the flat top of levees, but not necessarily coinciding with levee roads.
(Toe of) Levee	The point on a levee slope where the designed and constructed levee ends and natural ground begins.
Listed Species	A species that is formally designated as endangered or threatened by the state or federal Endangered Species Acts.
Long-Term Permit	This is a non-specific phrase for permits, authorizations, or memorandums of understanding from the United States Army Corps of Engineers, Regional Water Quality Control Boards, the State Water Resources Control Board, Bay Conservation and Development Commission, and the Department of Fish and Game that are for a specified period of time (e.g., 5 or 10 years) or an indefinite period.
Lower Watershed	Generally, the watershed below reservoirs, including the main channel and outlet to the Bay.
Maintenance Guidelines	Engineering standards developed for each District flood control facility that will give guidance on maintenance requirements for flood control capacity. The guidelines may include design information, historical information, or special requirements for a reach of channel.
Marshmog	A mechanized vegetation management vehicle with low ground pressure used for aquatic plant control in wetland and marsh areas. The Marshmog can be fitted with multiple attachments for mowing, cutting, discing, and applying herbicide. Developed by Clean Lakes, Inc. of Martinez, California.
Mean Higher High Water (MHHW)	The average height of the higher of the two high tides in San Francisco Bay.
Mean High Water (MHW)	In San Francisco Bay, there are two high tides each day, usually with different elevations. Mean High Water is defined as the average height of both of these two tides.
Mitigation	The term “mitigation” includes the following: (1) Avoiding environmental impacts by not taking a certain action or parts of an action; (2) Minimizing environmental impacts by limiting the degree or magnitude of the action and its implementation; (3) Rectifying the impact by repairing, rehabilitating, or restoring the impacted environment; (4) Reducing or eliminating the impact over time by

	preservation and maintenance operations during the life of an action; and (5) Compensating for the environmental impact by replacing or providing substitute resources or environments (State CEQA Guidelines, CCR Title 13 Chapter 3, Section 15370). The policies, implementation measures, and BMPs included in the Stream Maintenance Program have been designed to "mitigate" environmental impacts. The District Board of Directors has adopted the following definition, "Action taken by the District to fulfill CEQA/NEPA permit requirements and court-mandated mitigation to avoid, minimize, rectify, or reduce adverse environmental impacts, or to compensate for the impact(s) by replacing or providing substitute resources or environments."
Modified Channel	A waterway in which engineered alterations have occurred to improve the passage of flood flows or to provide drainage. This includes straightening (or channelization), containing a watercourse within constructed banks or levees, or lining banks with concrete, rip rap, gabions, or sack concrete.
~~**Modified Natural Channel**~~	~~A watercourse that has had improvements, such as bank protection (e.g., gabions, rip rap, other revetments), and selected areas of historical channelization (e.g., widening, straightening) and/or other capacity or passage improvements.~~
Multi-Stem	A tree or shrub with a root ball and multiple trunks or stems. This may occur at ground level or several feet above ground. The dbh of trees with multiple stems will be calculated by adding the diameters of the individual stems at 4.5 feet above ground. Individuals with greater than seven stems at dbh will be assessed by their canopy cover, per the *Tree Scoring for Removal of Trees and Shrubs ≤12" DBH* (April 2011), included with the Mitigation Approach Memo (Appendix C).
~~**Natural Channel**~~	~~A watercourse without any significant improvements or modifications and very little evidence of historical alterations.~~
Natural Flood Protection	A multiple-objective approach to providing environmental quality, community benefit and protection from creek flooding in a cost effective manner through integrated planning and management that considers the physical, hydrologic, and ecologic functions and processes of streams within the community setting.
Non-Native Plant	A plant species that, under natural conditions, does not originate within the ecosystem in which it is found.
Non-Native Vegetation	Any vegetation that, under natural conditions, does not originate within the ecosystem in which it is found. These species may be removed by SCVWD because of their invasive

	nature which typically reduces native vegetation cover and degrades natural habitat. Species include, but are not limited to: giant reed, tree tobacco, castor bean, pampas grass, cape ivy, eucalyptus and acacia.
Non-Jurisdictional	This term refers to USACE jurisdiction and was not intended to apply to RWQCB jurisdiction, under which "waters of the state" typically are construed to apply to a broader set of water bodies than "waters of the U.S." The District looks to the RWQCB's input as to the extent and nature of jurisdiction regarding canals; regardless, the District believes that compensatory mitigation would only be necessary if maintenance activities had the potential to impact beneficial uses—specifically, in places where impacts to riparian or wetland vegetation would occur, but not in unvegetated areas.
Obstruction	Material or objects which impede a facility from operating appropriately.
Ordinary High Water (OHW)	In non-tidal area, the highest level of water in a channel reached by commonly experienced flows. Defines the limit of the U.S. Army Corps of Engineers jurisdiction in the San Francisco Bay Area as the water level reached by flood flows with a predicted recurrence interval of 2.33 years.
Orographic	The effect that occurs when an air mass is forced from a low elevation to a higher elevation as it moves over rising terrain. The air mass cools, its relative humidity increases, and clouds may form.
Osteological	Pertaining to the scientific study of bones.
Outfall Structure	The end of a pipe or culvert that delivers local drainage into a creek. Features associated with an outfall structure may include erosion control materials, such as rip rap below the culvert or an energy dissipater. Further, a valve, such a flap gate, may also be part of the outfall structure.
Palustrine	Marsh-like.
Perennial Plant	A long-lived plant that typically has well-developed roots and above ground structures. May include herbaceous plants, vines, shrubs, and trees.
Pervious Hardscape	Hardscape, such as rock rip rap, gabions, and cellular soil confinement, which is not a barrier to water infiltration and that may allow (limited) revegetation growth.
Policy	Policies guide decision-making, both for individual stream maintenance projects and for the implementation of other related programs and projects. Policies are commitments made by the District Board of Directors.

Post-Emergent Herbicide	A herbicide designed to control target plant material after it has emerged. Post-emergents control plants by disrupting various growth mechanisms.
Pre-Emergent Herbicide	A herbicide designed to control target plant material prior to germination. Pre-emergents are applied to the soil surface, watered in through rainfall or artificial irrigation, and prevent germination and growth of seeds in the upper soil strata.
Preventive Maintenance (PM)	Preventative maintenance describes a group of work activities that are generated on a set schedule (most often annual or biannual) automatically for regularly scheduled work. Because of the type of work and location, these assigned work order codes will not need to be authorized by an environmental planner but will be required to follow SMP BMPs, including biological preconstruction authorizations.
Program	A program is a series of actions that can be described at a general level of detail. Programs include agency plans, policies, or regulatory programs.
Project Area	The area within the District that is subject to routine maintenance. This area contains 522.8 miles of creek channels.
Protocols	An established set of ground rules or procedures governing routine stream maintenance activities.
Reach	The smallest subdivision of a drainage system consisting of a uniform length of channel or a discrete portion of a channel.
Recharge	The replenishment of groundwater aquifers by infiltration.
Regrowth	The growth of vegetation subsequent to disruptive activities, such as sediment removal that originally removed all vegetation within the work or study area.
Repair	For the purposes of the Stream Maintenance Program, repair refers to maintenance of bank stabilization structure with in-kind, in-place materials. This type of maintenance occurs when such structures fail.
Residual Impact	Significant environmental impacts that cannot be avoided through the implementation of feasible site-specific measures. Significant residual impacts can be offset through a provision of compensatory mitigation.
Restoration	The reestablishment of the structure and function of ecosystems. Ecological restoration is the process of returning an ecosystem as closely as possible to pre-disturbance conditions and functions. Implicit in this definition is that ecosystems are naturally dynamic. It is therefore not possible to recreate a system exactly. The restoration process

	reestablishes the general structure, function, and dynamic but self-sustaining behavior of the ecosystem. The District Board of Directors has adopted the following definition, "Action taken by the District, to the extent practicable, toward the re-establishment of an ecosystem's pre-disturbance structure, function, and value, where it has been degraded, damaged, or otherwise destroyed."
Revetment	A term used to describe any number of hard structures used in bank stabilization.
Riprap	Loose rock or concrete of varying size, typically brought to a site. Used to protect channel banks from scouring forces.
Riparian	Located along the edge of a channel, generally on the floodplain. Characterized by access to and influence of the channel, but not in it. A riparian zone or riparian area is the interface between land and a river or stream. Riparian is also the proper nomenclature for one of the fifteen terrestrial biomes of the earth.
Riparian Corridors	Refers to a biological zone dominated by riparian vegetation immediately next to a channel. See "Riparian Vegetation."
Riparian Vegetation (or Habitat)	Riparian habitat is composed of the trees and other vegetation and physical features normally found on the stream banks and flood plains associated with streams, lakes, or other bodies of water. (http://www.wcb.ca.gov/Riparian/)
Riverine	Of, related to, or growing in rivers and streams.
Rootwad	A tree stump (dead or alive) with roots. May be used in place of hard structures during restoration activities.
Rotational Slump	Where a layer of permeable rock (absorbs water) in a cliff face sits upon a layer of impermeable rock(doesn't absorb water). When it rains, water soaks through the layer of permeable rock, but doesn't through the impermeable rock. A layer of water collects until the top layer of rock slips. The layer collapses down the front of the cliff face in a rotational manner.
Routine Stream Maintenance	Routine stream maintenance includes four major activities, as follows: (1) sediment removal activities that are designed to restore the flood capacity of existing District channels or associated features (e.g., tide gates), (2) vegetation management in and around the District's channels, including removal of vegetation for access and fire control, (3) bank stabilization activities necessary to protect District or other facilities, and (4) management of animal conflicts. Routine stream maintenance also includes more minor maintenance activities, such as trash removal; fence work; access road

	maintenance; repair of structures with in-kind materials within the same footprint (such as replacement of concrete linings, culverts, pipes, valves, or similar structures); cleaning and minor sediment removal at stream gages, outfalls, flap gates, tide gates, fish ladders; and graffiti removal.
Routine Stream Maintenance Project	For the purposes of the Stream Maintenance Program, a project is the whole of a routine stream maintenance action that is proposed for implementation through the Stream Maintenance Program. A project has a specific location, duration, and purpose. (An example of an individual project would be the removal of 3,000 cubic yards of sediment from Adobe Creek between Highway 101 and East Charleston Road.) Major construction and repair, including CIPs, are not defined as routine stream maintenance projects. In the Stream Maintenance Program, also referred to as "individual stream maintenance project," "individual project," "stream maintenance project," and "project."
Ruderal	Vegetation containing mostly introduced, weedy herbaceous species; "disturbance loving" species. Common in disturbed areas, along roadsides or vacant lots.
Runoff (surface)	The flow of water across the land surface and in stream channels. Occurs only after the local storage capacity of the landscape has been exceeded and includes both overland flow and streamflow.
Scour	The clearing and digging action of flowing air or water, especially the downward erosion caused by steam water in removing material (e.g., soil, rocks) from a channel bed or bank or around in-channel structures.
Secondary Channel	For purposes of the SMP, secondary channels are constructed features of a main channel that are designed with flood conveyance or maintenance purposes. These channels often have maintenance requirements that are different than the main channel and are therefore specifically managed and reported separate from the main channel.
Section 404	Refers to a section of the Clean Water Act establishing a permit program for the discharge of dredged or fill materials into Waters of the United States.
Sediment	Particles derived from rocks or biological materials that have been transported by a fluid, or solid material suspended in or settled from water.
Sediment Basin	A depression formed by the construction of a barrier or dam built at a suitable location to retain rock, sand, gravel, silt, or

	other material. In SCVWD, these basins also are commonly called "Debris Basins."
Sediment Load	The sediment that is in transport. Load is a general term that refers to material in suspension and/or transport. It is not synonymous with discharge.
Sediment Removal	The act of removing sediment deposited within a stream. Typically, sediment is removed when it reduces capacity. This is the sediment removal activity referred to most often in the Stream Maintenance Program, and included in the program-level impact analysis. There is a subset of sediment removal that is conducted for purposes of allowing appurtenant structures (stream gages, outfalls, diversion sills, flap gates, and tide gates) to continue functioning, and to clear fish passage and access to fish ladders and weirs. This latter category of sediment removal is considered "minor maintenance," as described in Chapter 3 of the Stream Maintenance Program.
Sensitive Habitat	A general term used to characterize habitats that either support sensitive species (listed species, species proposed for listing, and species of special concern) or are designated as a sensitive natural community in local or regional plans, policies, regulations, or by the CDFG or the U.S. Fish and Wildlife Service.
Sensitive Species	A general term for listed (i.e., on a state or federal endangered species list) species, species proposed for listing, and species of special concern (other species that may be of concern to state or federal agencies).
Serpentine Soil/Habitat	A serpentine soil is derived from ultramafic rocks, in particular serpentinite, a rock formed by the hydration and metamorphic transformation of ultramafic rock from the Earth's mantle. Soils derived from serpentine are toxic to many plants, because of high levels of nickel, chromium, and cobalt; growth of many plants is also inhibited by low levels of potassium and phosphorus and a low ratio of calcium/magnesium. The flora is generally very distinctive, with specialized, slow-growing species. Areas of serpentine-derived soil will show as strips of shrubland and open, scattered small trees (often conifers) within otherwise forested areas. As a result, serpentine habitat is typically host to a number of unique or rare plant species.
Shaded Riverine Aquatic Habitat (SRA)	The aquatic area occurring along the edge of a channel where the adjacent bank is composed of natural materials and supports riparian vegetation that overhangs or protrudes into the water and provides fish and other aquatic habitat.

Shear Stress	The force tending to cause deformation of a material by slippage along a plane or planes parallel to the imposed stress.
Shrub	Woody plant smaller in height than a tree (less than approximately 16 feet [5 meters] at maturity), often formed by a number of vertical or semi-upright branches arising close to the ground.
Significant Environmental Impact	A significant environmental impact is a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by a project, including land, air, water, minerals, flora, fauna, ambient noise, and objects of historic or aesthetic significance (State CEQA Guidelines, CCR Title 13 Chapter 3, Sections 15358 and 15382).
Significant Rainfall	Local rainfall 0.5 inches or greater within a 24-hour period in the subject watershed.
Soft Structures	A type of bank stabilization structure incorporating biological materials, such as seeds, plants, plant parts (e.g., root wads), or a combination of vegetation and inert materials (e.g., brush mats/sills, wattles, fascines, or branch packing/layering).
Softscape	Earth channel or levees, either natural or modified. Also refers to "soft forms of bank stabilization" such as root wads, log structures, etc. (see "hardscape," "hybrid," and bank stabilization table.
Sphere of Influence (SOI)	A formally designated area of unincorporated land adjoining a city that is considered to be in the city's (jurisdiction) sphere of influence for land planning based on geographic, economic, and social factors. The SOI is set by the State Local Agency Formation Commission (LAFCo) for each county.
Spreader Dam	Gravel berm placed across the channel to retain water in reaches of high channel permeability to improve ground water recharge.
Stakeholder	A stakeholder is an individual or organization who will be affected by or has an interest in the Stream Maintenance Program. Stakeholders include regulatory agency representatives, municipalities, and environmental and business groups.
Station	Station is a standard channel location system used by the District, which gives the distance from the downstream limit of jurisdiction (usually San Francisco Bay), or, for a tributary creek, from where it branches off of the main channel. Distance is measured in feet, with each "station" representing 100 feet. For example, station 43+56 would be

	a point 4,356 feet upstream from the mouth of the channel. Stations are used to define reaches (e.g., "From Station X – To Station Y").
Stewardship	To entrust the careful and responsible management of the environment and natural resources to one's care for the benefit of the greater community.
Stream	For the purposes of the Stream Maintenance Program, "streams" are defined as the natural watercourses and modified channels and canals within the District's jurisdiction. In this Program, streams include both the waterway and its immediate geographical corridor, including riparian corridors.
Stream Maintenance Program	The Stream Maintenance Program (SMP) will provide long-term guidance to the District to effectively implement routine stream maintenance projects in a cost-effective and environmentally sensitive manner. The Stream Maintenance Program is to be codified in a process and policy document that can be adopted by the District and utilized in obtaining long-term permits from regulatory agencies. The Stream Maintenance Program includes specific measures, protocols, and monitoring and reporting requirements to ensure that routine stream maintenance projects are implemented in an effective, cost-sensitive, and environmentally sensitive manner.
Stream Maintenance Program Project Area	The SMP project area includes streams and any adjacent property that the District owns or holds an easement for access and maintenance. The District does not provide maintenance on private property when no easement exists. Other than leveed creeks (which can require a wider maintenance easement), the maintenance work area is within approximately 20 feet of the top of bank when access is provided, and can be substantially less when access is not provided.
Streambed	The part of a stream over which a column of water moves.
Sudden Oak Death	Sudden Oak Death is the common name of a disease caused by the oomycete plant pathogen *Phytophthora ramorum*. The disease kills oak and other species of tree and has had devastating effects on the oak populations in California and Oregon.
Surfactants	A shorthand term for surface-active agent, which are chemicals that modify surfaces of two liquids or a liquid and a solid. In the context of the Stream Maintenance Program, surfactants are used in combination with herbicides to increase the retention and penetration of herbicides on and into plants.

Suspended Sediment	Fine particles suspended in the water column and carried along with the water at the velocity of flow. Compare with "Bedload."
Take (of a Listed Species)	To harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect a listed species or its habitat, or to attempt to engage in any such activity.
Thalweg	Main channel in the creek.
Tree	A species of woody perennial that typically has one dominant vertical trunk and a height greater than approximately 16 feet (5 meters) in its natural form. Tree species may have multiple trunks or be less than approximately 16 feet (5 meters) at maturity.
Trimming	The systematic removal of branches of a plant, usually a woody perennial (Harris 2004). Synonym for pruning.
Turbidity	The pollution of water by dissolved or suspended solids. The cloudiness of water, caused by suspended sediment. Turbidity is measured by the degree to which light penetration is blocked because the water is muddy or cloudy.
Unavoidable Impact	An unavoidable impact would occur if specific economic, social, legal, technical, or other considerations make mitigation measures or alternatives for the impact of a project infeasible. When such impacts are considered "significant," to support its decision on a project for which an EIR was prepared, a Lead Agency must prepare written findings the identify that either: (1) changes to the project are within another agency's jurisdiction and have been or should be adopted, (2) specific economic, social, legal, technical, or other considerations make mitigation measures or alternatives infeasible (State CEQA Guidelines Section 15091). In addition, the Lead Agency must adopt a Statement of Overriding Considerations which describes how the benefits of the project outweigh the unavoidable adverse environmental effects (State CEQA Guidelines Section 15092, 15096(h)).
Unmodified Stream	An unmodified stream is defined for the purposes of the SMP as a creek, river, or section thereof, which has not undergone the process of construction of modifications to meet specific flood control criteria. Examples of such criteria would include design to pass specific flows, such as a 25-year flood; or the protection of a specific number of homes, businesses, schools, etc. All unmodified streams will be assessed for flow conveyance in relation to their function within the watershed.

Unrevetted	Without revetment (i.e., a bare slope or channel side without hardscape protection).
Unvegetated	Areas containing either no, or only ruderal, vegetation. Examples would be locations that are concrete, or that support primarily annual non-native grasses and forbs. These areas provide little to no habitat value and, as such, maintenance activities in these locations would not have impacts requiring compensatory mitigation.
Upland	Terrestrial, referring to habitats that are not wetland or aquatic habitats.
Upper Watershed	Generally, the steeper portion of a watershed, above reservoirs and above urban areas.
Vegetation Management/Removal	Removal of vegetation in and adjacent to creeks to maintain the ability of channels to function as flood control facilities. In addition, vegetation is removed to meet local fire code requirements and to reduce combustible weeds and grasses on property adjacent to the streams within the District's jurisdiction. The control of invasive non-native vegetation is another purpose for which the District undertakes vegetation control. Vegetation management can be accomplished through mowing, discing, hand pruning, hand removal, or herbicide applications (depending on the environmental conditions of the site).
Waste Discharge Requirement	A legal mechanism of the state and regional Water Quality Control Boards to regulate discharges of dredge or fill materials.
Waters of the United States	Waters of the United States are tidal waters, all interstate waters, including wetlands, and all other waters which could involve interstate or foreign commerce.
Watershed	Entire area that drains to a common stream, synonymous with drainage area. A ridge or drainage divide separates a watershed from adjacent watersheds. For purposes of the SMP Update, watershed means the five SCVWD administrative watersheds: Lower Peninsula, West Valley, Guadalupe, Coyote, and Pajaro.
Wetlands	Those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetland is characterized by having the appropriate plant species (dependant on or capable of surviving root saturation), the appropriate hydrology (predictable saturation), and soils reflecting saturation and periodic anaerobic conditions.

Winterization

Winterization is the process to maintain project sites with the appropriate BMPs to prevent erosion, sediment transport, and protect water quality. Winterization occurs upon completion of bank repairs or on incomplete projects after October 15 and prior to the forecast of significant rainfall, 0.5 inches or greater of rainfall within 24 hours in the subject watershed. Winterization shall be completed prior to the occurrence of such actual significant rainfall. Winterization materials will be available and on-site when rain falls after October 15.

Winterization includes erosion control practices, sediment control practices, and general site and materials management.

- Basic ground rules for winterization:
  1. Direct runoff away from disturbed areas.
  2. Retain existing vegetation as much as possible.
  3. Fit grading to the surrounding terrain.
  4. Prepare temporary drainages and outlets.
  5. Grade/excavate outside of rainy season.
  6. Minimize length and steepness of slope.
  7. Stabilize disturbed areas by mulching, vegetating (hydromulching, hydroseeding, hydraulic matrices, blankets, etc.).
  8. Use every dissipating measure to keep runoff velocities low.
  9. Trap sediment on site.
  10. Inspect, log, and maintain control measures after each storm.
- BMPs may include use of:
  1. Silt fences
  2. Straw bales
  3. Straw wattles/fiber rolls
  4. Erosion control blankets, plastic sheeting
  5. Drain protection structures/drain filters
  6. Sediment basins
  7. Stabilized entrances/exits (incl. tire wash)
- Proper use of erosion and sediment control BMPs requires training by experienced professionals. Certifications are available through the IECA (International Erosion Control Association).

Woody Vegetation

Live vegetation having a stiff trunk or branch structure that is inflexible and does not bend over in flows. Typical vegetation types include trees and large shrubs.

Work Sites

The locations where maintenance activities are anticipated to occur. For the SMP Update, such locations have been identified for the 2012-2022 time frame.

EXECUTIVE SUMMARY

Introduction

The Santa Clara Valley Water District (SCVWD) has developed the Stream Maintenance Program (SMP) Update to review existing SMP activities, revise the SMP Manual, update the SMP's environmental compliance documentation, and renew necessary SMP permits. The SMP Update is considered a "project" for the purposes of the California Environmental Quality Act (CEQA) and is referred to as the "Proposed Project" or "SMP Update" throughout this document.

SCVWD has prepared this draft subsequent environmental impact report (DSEIR) to provide the public, responsible agencies, and trustee agencies with information about the potential environmental effects of implementation of the Proposed Project. This DSEIR was prepared in compliance with CEQA (Public Resources Code Section 21000 et seq.) and the State CEQA Guidelines (14 California Code of Regulations [CCR] 15000 et seq.). SCVWD is the lead agency on the Proposed Project.

Proposed Project Overview

The SMP Update has been prepared to provide guiding policies, specific direction on approach, and regulatory authorization for routine stream and canal maintenance activities. The Proposed Project would update the 2002 SMP, as necessary, to meet new conditions or maintenance needs of SCVWD. The SMP Update (including the 2012 SMP Manual [Appendix A] and this CEQA document) is an ongoing and continuous program with an indefinite time horizon; ~~intended to cover the~~a 10-year planning period beginning in 2012 and ending in 2022 has been used for the purposes of the regulatory permitting. These SMP Update documents are intended to fully replace the original documents that guided the SMP from its inception through 2012. The 2012 SMP Manual (included as Appendix A in this DSEIR) and the contents of the DSEIR are meant to be read as companion volumes. The DSEIR references or summarizes information (including figures and tables) presented in the 2012 SMP Manual frequently to avoid repeating information. The reader is encouraged to review the 2012 SMP Manual while reviewing the DSEIR.

Proposed Project Objectives

The overall flood management goals of the SMP Update are to maintain the design flow or appropriate conveyance capacity of SCVWD facilities, and to maintain the structural and functional integrity of SCVWD facilities.

To meet these goals, the SMP Update would prioritize and administer maintenance activities to achieve the following objectives:

- remove sediment to maintain the hydraulic, safety, and habitat functions of the creek systems;
- manage vegetation to maintain the hydraulic, safety, and habitat functions of the creek systems, and to allow for levee inspections and maintenance access;
- stabilize beds and banks of creeks and canals to protect existing infrastructure, maintain public safety, reduce sediment loading, protect water quality, and protect habitat values; and
- avoid, minimize, or mitigate impacts on the environment by incorporating stream stewardship measures into maintenance activities.

The SMP Update also seeks to obtain and maintain multi-year programmatic permits to regulate Proposed Project activities.

Proposed Project Background

SCVWD is responsible for water supply, flood protection, and stream stewardship in Santa Clara County, California. SCVWD flood protection facilities require maintenance to maintain the designed function of each facility. Historically, SCVWD has implemented these activities as needed. Therefore, the SMP Update would be a continuation of past routine creek and canal maintenance activities in most of the same areas using many of the same techniques. The difference between stream maintenance conducted before the SMP (pre 2002) and the initial SMP period (2002–2012) is the SMP Update's comprehensive approach to managing and tracking the maintenance work and costs, monitoring environmental conditions, and providing program mitigation. The SMP Update would be used by SCVWD staff to conduct routine stream maintenance practices in an efficient, consistent, and environmentally-sensitive manner.

The requirements and policies of the original SMP document were finalized in 2002, when SCVWD completed CEQA review requirements and received authorizations from all the permitting agencies with jurisdiction over the program. Work under the existing SMP began in 2002.

Project Area

The Project Area includes the portions of Santa Clara County below the 1,000-foot elevation contour, as shown in Figure ES-1. The Project Area includes streams within the Santa Clara and Pajaro basins. Municipalities within the Project Area that contain SCVWD-owned or maintained channels include the cities of Campbell, Cupertino, Gilroy, Los Altos, Milpitas, Morgan Hill, Monte Sereno, Mountain View, Palo Alto, San Jose, Santa Clara, Saratoga, and Sunnyvale, and the towns of Los Altos Hills and Los Gatos. SCVWD does not provide maintenance on private property where no easement exists, unless expressly authorized by the SCVWD Board of Directors.

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Horizon WATER and ENVIRONMENT

Figure ES-1: Project Area

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Proposed Project Channel Types

SCVWD actively manages over 1,000 miles of channels and creeks. For purposes of this document, the channels within SCVWD's jurisdiction are classified as earthen, concrete, tunnel, siphon, pipeline, or waterbody. The majority of SMP channels are earthen, having earthen channel bed and banks. SCVWD-maintained earthen channels may be either engineered or natural stream channels.

The SMP Update would not cover maintenance activities at reservoirs, dams, pipelines outside of stream corridors, groundwater percolation facilities, in-stream summer dams, or work in stream reaches above the 1,000-foot elevation contour.

Proposed Project Description

Overview of SMP Update Approach

Based on the work performed during the SMP 2002–2009, SCVWD has developed projections for reasonably anticipated work expected to occur over the next decade of the Proposed Project (2012–2022). Actual stream maintenance activities vary from year to year, depending on weather and hydrologic conditions, frequency and extent of past maintenance activities, and budget/funding availability. Future maintenance needs may occur, consistent with the overall SMP Update projections, but they may vary from the specific location originally projected.

Maintenance activities would be permitted throughout the Project Area, as long as they did not result in new or more significant environmental effects than those evaluated and disclosed in this DSEIR. The 2012–2022 maintenance work projections represent the District's best estimate of where work is likely to occur. The work projections are "conservative" in that work is not likely to occur in all of the newly identified reaches shown on the maps presented in Chapter 2. The work projections are a useful basis to consider potential programmatic impacts to wetlands and other habitats and, therefore, to develop a suitable mitigation approach that can guide the next decade of the program.

The SMP Update has been designed to be adaptable. One way the SMP Update would achieve this would be by supporting site-specific assessments to determine the most effective method to achieve the maintenance goal. As conditions allow and technologies and environmental regulations evolve, this would support an assessment for work activity modifications that could result in decreased impacts.

Maintenance Activities

The SMP Update would involve five categories of work activities: bank stabilization, sediment removal, vegetation management, management of animal conflicts, and minor maintenance. In addition, the SMP Update would include maintenance of canals, which may include any of these five activities.

Bank Stabilization

Stream bank stabilization activities would involve actions by SCVWD to repair eroding stream banks and levees. SCVWD may implement stream bank stabilization activities when the problem: causes or could cause significant damage to SCVWD property and/or adjacent property; or is a public safety concern. Additional benefits of stabilizing eroding stream banks include reducing instream sedimentation, and protecting water quality and other beneficial uses such as riparian habitat and recreation.

Bank stabilization work could be performed along any creek or canal where SCVWD has fee title or easement, or was otherwise directed by the SCVWD Board of Directors. Based on the maintenance work conducted from 2002–2010, the District stabilizes about 0.94 mile of stream channel banks or levees on average per year. The 2012 SMP Manual (Appendix A) describes the specific bank stabilization techniques and approaches. SCVWD favors the use of soft bank stabilization approaches that use bio-technological approaches in place of methods that create more hardened banks.

Sediment Removal

Sediment removal is the act of mechanically removing sediment deposited within a flood protection channel. Sediment removal is required when accumulated sediment reduces a channel's flow conveyance capacity, prevents facilities or appurtenant structures from functioning as intended, or impedes fish passage and access to fish ladders. Sediment is removed from SCVWD facilities to allow channels to convey flow and minimize flood hazard, according to the original channel design. Sediment removal under the SMP Update would not include increasing a channel's flow conveyance capacity beyond the as-built design. Sediment removal activities may occur along creeks, canals, or at stream gauges.

Sediment removed from SCVWD channels and facilities would be assessed according to the appropriate Sediment Characterization Plan established by the San Francisco Bay and Central Coast Regional Water Quality Control Boards. These characterization plans would be used to determine the physical and chemical properties of the removed sediment, using continuous core, discrete sampling and residual sampling methods. Collected sediment that met wetland reuse criteria could be transferred to the South San Francisco Bay Pond A8 to support levee restoration efforts at the pond. Sediment that did not meet these standards but met standards for landfill disposal would be disposed at a local landfill. Sediment that exceeded hazardous waste criteria would be disposed at an appropriate hazardous waste facility (e.g., Kettleman Hills hazardous waste landfill). Pond A8 is anticipated to have sufficient capacity for sediment disposal for the next 2–5 years. Additional ponds, including ponds A5, A1, A2W, and A9 have been identified as other potentially suitable long-term sediment reuse locations. SCVWD also may add other upland or aquatic sites to its disposal options. Potential upland sites include the abandoned quarry pond next to the Coyote Parkway site, as well as the U.S. Fish and Wildlife Service refuge at Bair Island and Phase 2 of the South Bay Salt Pond restoration effort.

Annual sediment removal needs would vary, depending on yearly climate and hydrologic conditions. Sediment removal could be performed in any stream within the Project Area.

Vegetation Management

Similar to sediment removal activities, vegetation management activities are intended to maintain the hydraulic conveyance and flood safety functions of SCVWD's channels. Vegetation maintenance would seek to trim, thin, or remove vegetation that was causing flow blockages or significantly increasing hydraulic roughness and, thereby, reducing channel conveyance capacity. Vegetation management methods would include pruning, hand or mechanical removal, herbicide application, mowing, discing, flaming, and grazing.

SCVWD's preference is to first thin or prune trees before considering tree removal. However, when tree removal is necessary, SCVWD prioritizes retaining native trees in place of non-native species. The removal of trees and shrubs less than or equal to 12 inches diameter at breast height (dbh) is permissible only if they are required for bank stabilization projects, ecological health/stewardship purposes, or to maintain flow conveyance. As defined in the projections (Chapter 2, *Project Description,* or Appendix A, 2012 SMP Manual), vegetation management may occur from the creek center to the outer edge of the SCVWD property line/SCVWD management area. Other types of vegetation management (e.g., flaming and grazing) would be performed on an as-needed basis along any creek within the Project Area where SCVWD has fee title or easement. Tree removals may occur on a site-specific basis, per the criteria and mitigation described in the SMP Manual.

Management of Animal Conflicts

In the Project Area, animals can damage SCVWD channels, facilities, and infrastructure. The stability of banks and levees may be reduced as a result of burrowing, foraging on mitigation sites, and interfering with work activities. Management of animal conflicts refers to the use of avoidance tactics, biological control, site alterations, habitat alteration, and lethal control to reduce conflicts between SCVWD facilities and local species. These control methods are described in the Management of Animal Conflicts chapter of the 2012 SMP Manual (Appendix A).

Although routine, the extent and specific locations for animal conflicts management are generally not known before the maintenance season; although routine rodent control activities would occur on designated levee reaches.

Minor Maintenance

Minor maintenance activities would be performed to repair and maintain SCVWD facility functions. Minor maintenance activities may occur along creeks, canals, or at existing stream gauges. Minor maintenance activities would have limited potential to impact environmental resources. A minor activity is defined as an activity that results in removing less than 0.05 acres (2,178 square feet) of wetland or riparian vegetation. The minimum reporting size for any minor vegetation work to be notified in SCVWD's Notice of Proposed Work would be 0.01 acres (436 square feet) per project, which would include any vegetation work necessary for access or staging. Minor maintenance activities may occur anywhere within the Project Area.

Minor maintenance activities proposed under the SMP Update would include:

- cleaning and minor sediment removal at outfalls, culverts, flap gates, tide gates, inlets, grade control structures, fish ladders, fish screens (limited to 50 cubic yards [cy]);
- minor in-channel (or canal) sediment removal (less than 10 cy);
- trash and debris removal;
- repair and installation of fences and gates;
- grading and other repairs to restore the original contour of existing maintenance roads;
- grading small areas without vegetation above stream banks to improve drainage and reduce erosion;
- repair of structures with substantially similar materials within approximately the same footprint (i.e., replacement of concrete linings, culverts, pipes, valves);
- graffiti removal;
- installation and on-going maintenance of mitigation and landscape sites (including irrigation, weed control, and replanting of dead or declining individual plants until success criteria were met);
- removal of obstructions at structures to maintain function (i.e., bridges, stream flow measuring stations, box culverts, storm drain outfalls and drop structures); and
- stream gauge maintenance including stilling well cleaning, painting of gauge house, replacing/adding antenna or solar panels to existing structures, replacing instrumentation, cableway repair, weir cleaning of algae and debris, and unburying staff markers/orifice/communication pipes.

Canal Maintenance

The SMP Update would include routine and periodic maintenance conducted by SCVWD on its canals. Unlike the streams and flood protection channels that are the primary focus of the existing SMP, SCVWD's canals are primarily water supply transport facilities and may provide incidental flood protection. Routine canal maintenance may include all general work activities discussed above, including sediment removal, vegetation management, management of animal conflicts, bank stabilization, and minor maintenance.

Sediment removal in canals is typically small in scale and localized (generally 10 cy or less per occurrence), and is conducted to clear small sediment deposits ("plugs") where local sediments have either entered the canal or been deposited. Sediment removal may occur anywhere along the canals, however no more than 1,000 cy of sediment would be removed per calendar year from all SCVWD canals.

Vegetation management along the canals would include some periodic herbicide use, inside the canals and along the access roads, to address weed growth. In the upland margins adjacent to the canals, SCVWD would conduct periodic and routine tree hand pruning, hand removal, and grass mowing, using the same techniques described above in the *Vegetation Management* section. In general, vegetation management may occur anywhere along or within the canals; however, no more than 6 acres of work would be performed in a given calendar year. In addition, discing would be restricted to the right bank of Coyote Alamitos canal only.

Additional minor maintenance activities performed along the canals would include minor grading of the access road, graffiti removal, fence repair, erosion repairs, management of animal conflicts, and bank stabilization activities. Minor structural repairs may include repairing a concrete lining, culvert, pipe, valve, weir, instream orifice, or communication pipe. These canal maintenance activities may occur anywhere along the canals, as needed.

Activities Not ~~Covered~~ in the SMP Update

The SMP Update would not include the following activities, which are therefore not analyzed in this DSEIR:

- work that would increase the designed flood conveyance or water supply capacity of a facility;
- maintenance work in stream reaches above the 1,000-foot elevation contour;
- removal of hazard trees;
- maintenance work for dams, reservoirs and other water supply facilities, such as pipelines outside of stream corridors, groundwater percolation ponds, and in-stream summer dams;
- installation of new or major modification of fish ladders;
- work conducted on private property by others;
- work performed by other agencies;
- other large construction projects or capital improvement projects;
- area-wide, intensive maintenance, or rehabilitation of large (greater than 0.05 acre) mitigation projects installed as part of SCVWD Capital Improvement Projects;
- emergency repair work; and
- continued implementation of mitigation measures in the existing SMP.

Stream Maintenance Process Overview

Annual administration of the SMP Update would occur in three phases, as described in detail below.

Phase 1: Annual Maintenance Activity Identification, Development and Documentation

The first phase of the annual work sequence would begin with identifying maintenance needs. Maintenance work could be proposed either as part of the annual work plan through the Notice of Proposed Work, subsequent regulatory notifications/submittals, or as identified throughout the year via individual work orders. SCVWD internal work orders would provide a description of the project, schedule of implementation, estimated costs, permit requirements, and other special conditions.

For minor maintenance activities, the appropriate resource protection measures and BMPs would be identified and work would proceed. For other maintenance activities, a more detailed review process would occur and may include site assessment and/or engineering evaluations. These activities would be reviewed to verify they were covered under the long-term regulatory clearances provided in conjunction with the SMP Update. If the work was not covered by the SMP Update, the appropriate project development process would be followed and may include individual CEQA review and project-specific regulatory permits or clearances. For covered activities, appropriate resource protection measures and BMPs would be identified and added to the work order. Pre-work meetings would be held with appropriate SCVWD staff to discuss site-specific requirements, environmental constraints, and BMPs.

Phase 2: Implementation of Annual Routine Stream Maintenance Work

Maintenance activities would be implemented during the appropriate work season or as described in the work order. In addition, direct field monitoring of maintenance work would occur for both sediment removal and bank repair activities, enforcing BMPs to effectively prevent adverse impacts to water quality and stream habitats.

Maintenance Timing

Work windows for sediment removal, in-stream vegetation and herbicide application, and bank stabilization generally would be conducted between June 15 and October 15. However, if the fall season remained dry, work could continue until the first significant rainfall event occurred. Sediment removal may occur after a significant rainfall under special circumstances but only in low quality areas. A significant rainfall event is defined as local rainfall of 0.5 inches or greater within the watershed over a 24-hour period. Even if no significant rainfall occurred, no instream work (excluding hand pruning and hand removal in non-steelhead streams) would continue later than December 31.

After October 15, 72-hour look-ahead weather forecasts from the National Weather Service (or local vendor such as the Western Weather Group) would be consulted. If a significant rainfall was forecast within the 72-hour forecast window, maintenance work that may

result in sediment runoff to the stream would be stopped, to allow adequate time to complete erosion control measures.

Bank Stabilization

SCVWD has committed that no more than half of non-in-kind bank repairs would consist of impervious hardscape each year. Equipment used for bank stabilization activities may include excavators, bulldozers, and front-end loaders for bank grading and earth-moving activities. Staging typically would occur on adjacent access roads. Soil and other repair materials typically would be staged in areas that were previously disturbed (i.e., service roads, turn-outs). In some cases, bank stabilization projects may require the installation of temporary roads and ramps to access the work site. Where trees may have to be removed, SCVWD would target non-native trees for removal. The average duration of bank stabilization work is 10 working days per site.

Sediment Removal

Sediment may be removed by excavators, grade-alls, draglines, and/or loaders. Temporary dams, pipes, and existing overflow channels would be used if water needed to be bypassed around the site during work. Sediment removed from the channel typically would be placed in 10- or 20-cy dump trucks, and prepared for off-site hauling and disposal. Stockpiling of sediment to allow for drying before disposal only would be done when sufficient space would allow the temporary piling of material; however, this would not be typical. The average duration of a sediment removal project would be 10 days, although larger work sites would require up to 6 weeks to complete.

Vegetation Management

Vegetation management techniques would include hand removal, using small tools and hand-held equipment (chainsaws, weed-eaters, and flamers), mechanical removal using heavy equipment, herbicide application, and grazing. Heavy equipment used for vegetation removal may include a disc attachment on a tiller to clear aboveground herbaceous plants on the upland parcels outside of stream banks; flail mowers to cut weeds and other non-native vegetation on the inside slope of some levees or stream banks; or a backhoe or rubber-tracked excavator, used for removing material from the channel.

New techniques (described in the 2012 SMP Manual [Appendix A]) would include grazing and the use of flamers to manage vegetation. Flaming would involve the use of a hand-held, propane gas-powered flamer to control weed seedlings. In limited circumstances, SCVWD may use various domestic animals to provide non-specific weed control.

Herbicide application in upland areas typically would be sprayed from a truck-mounted rig or applied using a controlled drop applicator. Spray trucks would be used to apply herbicides to areas such as maintenance roads. Herbicides may be selectively sprayed instream, following appropriate biological surveys and clearances. Only herbicides and surfactants approved for aquatic use by the U.S. Environmental Protection Agency and registered for use by the California Department of Pesticide Regulation would be used for SCVWD's aquatic vegetation control work.

The SMP Update includes an expanded list of herbicide types and a broader area of application. The Proposed Project would enable herbicide use within the Pajaro River watershed and incorporate surfactants under restricted conditions as an application aid. Additional application adjustments would include a longer work window, application in upland areas, and application in sensitive species habitat under certain restrictions.

Management of Animal Conflicts

Management of animal conflicts generally would be conducted with the use of hand-placed materials using small tools and hand-held equipment. This would include establishing buffers and biological repellants, trapping, as well as lethal baiting and fumigant applications. Heavy equipment may be used to modify habitat conditions and reduce or eliminate burrowing animals through surface compaction, filling of burrows with slurry, and tilling areas to destroy food sources. All lethal control methods would be designed to comply with County Agriculture Commission requirements and would be implemented using BMPs that would be designed to avoid or minimize effects on special-status species.

Phase 3: Annual Reporting

At the conclusion of each year's maintenance season, a Post-Construction Report would be developed and submitted to the appropriate resource agencies. This report would include a summary of the year's maintenance projects, describing what activities occurred and where, a description and confirmation of the restoration and mitigation activities implemented, and other SMP updates as necessary.

Program Review

Following the submittal of the Post-Construction Report, resource agency staff would be invited to meet with SCVWD staff for a "lessons learned meeting," usually in February or March of each year, to evaluate the effectiveness of both resource protection and maintenance methods used in the preceding construction season. The information discussed at these annual lessons learned meetings would be used to adaptively manage the BMPs and SMP processes to improve SMP effectiveness.

Programmatic Impact Avoidance, Minimization, and Compensatory Mitigation

A three-part sequence would address Proposed Project impacts. First, the SMP Update itself has several built-in or internal restrictions and protocols to avoid or minimize impacts by limiting how and where maintenance could occur. Second, the operational implementation of maintenance activities would be required to adhere to specific BMPs. Thirdly, residual impacts remaining after these two impact avoidance and minimization efforts would be addressed through compensatory mitigation. These three approaches to address potential Proposed Project impacts are further described next.

Programmatic Impact Avoidance and Minimization

The SMP Update would incorporate the following overarching principles to protect natural resources and guide decision-making for stream maintenance activities and projects:

Principle 1: SCVWD will implement all routine stream maintenance activities according to the process and protocols established in the SMP Update.

Principle 2: Decisions regarding the necessity of routine sediment removal and vegetation management activities (to restore channel flow capacities) will be made following the thresholds and standards provided in the District's Maintenance Guidelines and Asset Management Program.

Principle 3: SCVWD will implement measures to avoid and minimize impacts to native species and habitat.

Principle 4: All maintenance activities will be performed in a manner that has the least impact to the natural flora, fauna, and aquatic resources while meeting SMP Update objectives.

Supporting these SMP principles, measures and protocols would be applied by SCVWD for effective work results while avoiding or minimizing potential environmental impacts, including conducting no work above the 1,000-foot contour level, identifying the minimum maintenance need, and considering existing channel features in analysis and design.

Best Management Practices

Maintenance activities would incorporate a range of measures to minimize undesired effects on the environment and to implement the SMP principles described above. BMPs specifically created for the SMP Update would encompass the range of proposed maintenance activities and the environmental conditions of the Project Area. Types of BMPs would include general BMPs that would apply to all work, as well as activity-specific BMPs designed to address anticipated effects of certain work activities or particular types of resources. See Table 2-12 for a description of the BMPs proposed to be used in the SMP Update.

Compensatory Mitigation

Summary Status of the 2002 SMP Mitigation Program

Although not all 2002 SMP Mitigation Program requirements have been met, it is important to recognize that the original mitigation requirements were based on the full estimated impact of the 2002 SMP work projections. Not all of the projected work has been conducted, nor have all the estimated impacts occurred. For tidal wetland impacts in the Santa Clara Basin, conducted mitigation has met the full mitigation requirement and provided 21+ acres over the mitigation necessary, when considering how much actual work and impacts have occurred in tidal wetlands. For freshwater wetland impacts in the Santa Clara Basin, conducted mitigation has not satisfied the complete mitigation requirement and is about 76

percent in pace with the maintenance work conducted (and impacts) that have occurred. In the Pajaro Basin, freshwater wetland impacts have been mitigated fully.

SMP Update Mitigation Program

The proposed SMP Update process includes reviewing and renewing the existing compensatory mitigation package that was established in 2002. The 2002 SMP Mitigation Program that covers the original projected activities (sediment removal and vegetation management) would remain in place to provide compensatory mitigation in perpetuity for the channels identified in the 2002 work projections.

As part of the proposed SMP Update process, the compensatory mitigation program addresses potential impacts anticipated for work sites that were not included in the original SMP work projections and not accounted for in the initial compensatory mitigation package. Besides addressing mitigation for these new work sites, the compensatory mitigation program has been revised to improve overall mitigation feasibility and quality. A key constraint to the original SMP mitigation approach was its emphasis on land acquisition. As a result, feasible mitigation was often not available in a manner to support the program's needs. For the SMP Update, a broader suite of suitable mitigation approaches has been developed to provide increased flexibility while maintaining high mitigation quality. The revised mitigation program, discussed in detail in Appendix C) would include the following elements:

- Acquisition and Restoration Program
- Invasive Plant Management Program
- Riparian Planting Program
- Mitigation for Tree and Shrub Removals 6-12 inches (dbh)
- Instream Habitat Complexity Program
- Gravel Augmentation in Steelhead Creeks
- Species-Targeted Habitat Mitigation
- Bank Stabilization Mitigation

Public Involvement Process

Scoping Comment Period

In accordance with State CEQA Guidelines (14 CCR 15082[a], 15103, 15375), SCVWD circulated a Notice of Preparation (NOP) of a DSEIR for the Proposed Project on August 31, 2010 (Appendix B). The NOP, in which SCVWD was identified as lead agency for the Proposed Project, was circulated to the public; to local, state, and federal agencies; and to other interested parties. The purpose of the NOP was to inform responsible agencies and the public that the Proposed Project could have significant effects on the environment and to solicit their comments. Comments received in response to the NOP were considered during preparation of this DSEIR (Appendix B).

Public and Agency Review of the DSEIR

This document will be circulated to local, state, and federal agencies and to interested organizations and individuals who may wish to review and comment on the report. Its publication will mark the beginning of a 45-day public review period. Written comments or questions concerning this DSEIR should be directed to the name and address listed below. Submittal of written comments via e-mail (Microsoft Word format) will be greatly appreciated.

Santa Clara Valley Water District
Attention: Sunny Williams
5750 Almaden Expressway
San Jose, CA 95118-3686
E-mail: smp_update@valleywater.org
Subject Line: SMP Update EIR Comments

All documents mentioned herein or related to the Proposed Project can be reviewed on any SCVWD business day between the hours of 8 a.m. and 5 p.m. at SCVWD headquarters, located at the address shown above.

Preparation of FSEIR and Public Hearing

Written and oral comments received in response to the DSEIR will be addressed in a Final Subsequent Environmental Impact Report (FSEIR), which will include all comments received, responses to each, and a reprint of the DSEIR, updated as appropriate in underline/~~strikeout~~ in response to the comments. After review of the FSEIR, SCVWD staff will recommend to the SCVWD Board of Directors whether to approve or deny the Proposed Project. The Board then will review the FSEIR, consider staff recommendations and public testimony, and decide whether to certify the FSEIR and approve or deny the Proposed Project.

If the Board approves the Proposed Project in spite of significant impacts identified by the FSEIR that cannot be mitigated, the Board must state in writing the reasons for its actions. A Statement of Overriding Considerations must be included in the record of the Proposed Project approval and mentioned in the Notice of Determination (14 CCR 15093[c]).

Areas of Known Controversy

No areas of public concern have been identified regarding the SMP Update.

Key Issues and Significant Impacts

This section discusses key issues of concern relative to the Proposed Project and the conclusions of this document regarding those issues, as well as any significant impacts that were identified. This is not a comprehensive discussion of impacts of the Proposed Project; the reader is directed to Table ES-1, Summary of Impacts and Mitigation Measures, at the end of this chapter. Environmental factors potentially affected by the SMP include:

- Aesthetics
- Air Quality
- Biological Resources
- Cultural Resources
- Global Climate Change
- Hazards and Hazardous Materials
- Hydrology and Geomorphology
- Land Use and Planning
- Noise
- Public Services and Utilities
- Recreation
- Traffic and Transportation
- Water Quality

Chapter 3, *Environmental Setting and Impact Analysis*, and Chapter 4, *Other Statutory Considerations* of this DSEIR address each of these environmental resource topics and the impacts of the SMP Update.

Temporary Impacts from Maintenance Activities

In general, the primary adverse impacts of SMP Update activities would be short term and would occur during maintenance and the period immediately following maintenance. Temporary impacts would include:

- adverse effects on aesthetics, dust and air emissions from maintenance vehicles and equipment,
- effects on riparian and aquatic habitats and associated species,
- potential exposure to sites of existing chemical contamination,
- potential for accidental releases of hazardous materials associated with maintenance vehicles and herbicide use,
- discharge of sediments and related effects on water quality,
- temporary exposure of the public to elevated noise levels associated with maintenance activities,
- temporary disruption of recreational opportunities or quality during maintenance, and
- effects on local traffic from maintenance vehicles and hauling of sediment and other debris.

However, the SMP Update would include a multi-tiered program to avoid or minimize and compensate for impacts. First, the SMP Update would involve pre-maintenance impact avoidance through the use of maintenance principles. These principles would include conducting no unnecessary maintenance or intervention, and to target maintenance activities to reduce their impact. Second, during maintenance activities, a variety of BMPs would be implemented as part of the Proposed Project. These BMPs would be implemented before, during, and following maintenance. The BMPs would include avoidance of impacts, reducing the intensity/extent of potential impacts, and revegetation and other on-site activities that would be implemented to shorten the duration of site recovery. Finally, mitigation measures have been designed to address potential impacts that would remain after the implementation of BMPs, including a compensatory mitigation program to offset residual impacts related to biological resources and water resources (e.g., those potentially significant impacts remaining after implementation of BMPs and other issue specific mitigation measures). With the exceptions of air and greenhouse gas emissions, habitat

fragmentation, aesthetics, and noise impacts to sensitive receptors, all short-term impacts of the SMP Update would be reduced to a level of insignificance.

Long-Term Impacts from Maintenance Activities

Over the long term, SMP Update activities are anticipated to provide a variety of beneficial impacts. The Proposed Project would provide channel maintenance to maintain design flood conveyance capacity, as well as to help establish a developed riparian corridor along the maintained channels, resulting in incrementally improved conditions over time (i.e., ecological lift). This would result in enhanced habitat values, improved water quality, and better recreational value.

Several long-term adverse impacts have also been identified, including the potential for SMP Update activities to result in cumulative adverse contributions of air emissions or greenhouse gases; impacts on biological resources and habitat fragmentation; harm to existing archeological or paleontological resources; as well as cumulative land use conflicts, noise generation, traffic disruption, and water quality effects. However, BMPs would be implemented, consistent with the 2012 SMP Manual, that would include measures to address these impacts. Furthermore, mitigation measures (described in Chapter 3.3, *Biological Resources)* would be applied to address cumulative impacts on biological resources. With the exception of cumulative impacts associated with air emissions, greenhouse gases, and habitat fragmentation, all long-term impacts of the SMP Update would be reduced to a level of insignificance.

Significant and Unavoidable Impacts

The following impacts have been identified as significant and unavoidable:

- Impact AES-3: Temporary Alteration of Visual Character or Quality from Maintenance Activities
- Impact AES-4: Permanent Alteration of Visual Character or Quality from Maintenance Activities
- Impact AIR-1: Temporary Increase in ROG, NOx, PM_{10}, and $PM_{2.5}$ Emissions during Maintenance Activities
- Impact BIO-45: Habitat Fragmentation
- Impact GCC-1: Temporary Increase in GHGs during Maintenance Activities
- Impact NZ-1: Temporary Exposure of the Public to Noise Levels in Excess of City or County Standards
- Impact NZ-3: Temporary Substantial Increase in Noise above Ambient Levels
- Cumulative Impact AIR-1: Emissions of ROG, NOx, PM_{10}, and $PM_{2.5}$
- Cumulative Impact AIR-2: Emissions of Greenhouse Gases
- Cumulative Impact BIO-2: Habitat Fragmentation

Alternatives Considered

The purpose of the alternatives analysis in an EIR is to describe a range of reasonable alternatives to the Proposed Project that could feasibly attain most of the objectives of the Proposed Project while reducing or eliminating one or more of the Proposed Project's significant effects. The range of alternatives considered must include those that offer substantial environmental advantages over the Proposed Project and may be feasibly accomplished in a successful manner considering economic, environmental, social, technological, and legal factors.

The following alternatives have been evaluated for their feasibility and their ability to achieve most of the Proposed Project objectives while avoiding, reducing, or minimizing significant impacts identified for the Proposed Project:

- No Project Alternative
- Reduced Frequency Alternative
- Limited Work in Unmodified Channels Alternative
- Limited Activities Alternative

No Project Alternative

Under the No Project Alternative, SCVWD would continue conducting maintenance activities, including CEQA compliance and permitting, on an annual basis following the practices in the existing (2002) SMP. This would accomplished either be (1) conducting CEQA compliance and permitting on a project-by-project basis, or (2) by extending or renewing the existing SMP permits and relying on the prior CEQA document. SCVWD would conduct the same maintenance activities as done currently, using existing operation and maintenance guidelines and BMPs. One main difference between this alternative and the Proposed Project is that the Proposed Project would include an extension of the end of the maintenance period, from October 15 to December 31, as long as weather remained dry. If project-by-project permitting was implemented, some needed maintenance likely would not be conducted during the same season as the need for it was identified, resulting in the potential for increased flood risk. Therefore, possibly less maintenance work would get accomplished each year.

If less maintenance work was completed each year, then maintenance activities would be performed at each reach less frequently, and/or less work would be completed overall. As a result, a variety of impacts would be slightly reduced, compared to the Proposed Project. Sediment discharges from areas requiring bank stabilization, combined with increased sediment accumulation resulting from the longer period between maintenance activities, would result in a greater temporary reduction in conveyance capacity than the Proposed Project. Consequently, it is expected that the No Project Alternative would provide a slightly lower level of flood protection than the Proposed Project. The existing BMPs, to the extent they would not be as protective as the BMPs proposed for the SMP Update, may not reduce the impacts of maintenance to the same extent as under the Proposed Project. Furthermore, because SCVWD may not know what the mitigation requirements would be more than one year in advance, biological impacts would need to be mitigated on an annual basis. Should

project-by-project permitting lead to undertaking mitigation in smaller increments, the overall mitigation may be less ecologically significant than the comprehensive approach proposed by the SMP Update.

Reduced Frequency Alternative

Under the Reduced Frequency Alternative, the types of maintenance activities undertaken by SCVWD would not change, but the recurrence of sediment removal and vegetation management activities would occur less frequently than under the Proposed Project. However, bank stabilization, management of animal conflicts, and minor maintenance activities would continue to occur as needed. All other aspects of the Proposed Project (e.g., the currently proposed BMPs) would be implemented under this alternative. Under the Proposed Project, the recurrence of activities is projected for a 10-year period. Typically, the need for sediment removal or instream vegetation management is based on field observations of reduced channel capacity from sediment accumulation or vegetation growth; non-instream vegetation management addresses annual growth, including the removal of both pre-emergent and post-emergent vegetation. Under the Reduced Frequency Alternative, the recurrence of sediment removal and vegetation management activities at any particular location would be half as frequent as under the Proposed Project. For example, if a stream reach was projected to need sediment removed in 4 out of 10 years, under this alternative, sediment would be removed in 2 out of 10 years.

Although maintenance activities would occur less frequently, the amount of maintenance done during each event would likely need to be greater to fulfill maintenance needs. For instance, a greater amount of sediment removal or instream vegetation management would need to occur during a maintenance event to maintain the design flood flow conveyance capacity during the longer periods between maintenance episodes. A greater amount of non-instream vegetation management also would need to occur during a maintenance event, to address fire hazards on roads and levees associated with a greater amount of vegetation growth. Similarly, different types of maintenance may be necessary (e.g., removal of larger trees may require larger equipment).

Compared to the Proposed Project, impacts would be theoretically reduced because maintenance events would occur less frequently; however, this may be offset by the increased intensity associated with the less frequent, larger maintenance events. The frequency and intensity of maintenance events would have various impacts. Increased sediment accumulation and instream vegetation resulting from the longer period between maintenance activities would result in a greater temporary reduction in conveyance capacity, and thus an increased flood risk, than the Proposed Project. However, because larger maintenance events would occur, flood flow conveyance capacity could be retained over the long term. Increased non-instream vegetation growth, resulting from the longer period between maintenance activities, would result in greater temporary fire hazards on roads and levees than the Proposed Project.

Limited Work in Unmodified Channels Alternative

Under the Limited Work in Unmodified Channels Alternative (Limited Work Alternative), maintenance activities that could be done in unmodified channels would be limited to

within 100 feet upstream and downstream of human-made structures, such as bridges, road crossings, stream gages, outfalls, and trash racks. As a result, a reduced amount of annual maintenance would occur under this alternative. Maintenance near human-made structures would be necessary because it would keep these structures functioning properly and safely. Necessary maintenance activities in unmodified channels located away from human-made structures would not occur, resulting in increased flood risk or unaddressed maintenance needs. All other aspects of the Proposed Project (e.g., the currently proposed BMPs) would be implemented under this alternative.

The primary goal of the Limited Work Alternative would be to reduce impacts to biological resources in unmodified channels, as the unmodified channels are believed to have the greatest ecological value overall. The majority of impacts to biological resources in unmodified channels would be eliminated, but some disturbance and impact to unmodified channels would be necessary to maintain human-made structures. Compared to the Proposed Project, the Limited Work Alternative may promote the ecological structure and function of unmodified reaches by reducing impacts to plant and animal species, riparian habitat, and wetlands. To the extent that maintenance activities would support or improve ecological structure and function (for instance, create conditions unfavorable to invasive exotic species), these benefits would not be realized to the same extent as under the Proposed Project.

Under the Limited Work Alternative, the overall amount of maintenance would likely be reduced. As a result, various impacts would be reduced, compared to the Proposed Project. Sediment discharges from bank failures that would not be addressed under this alternative would result in a greater temporary reduction in conveyance capacity than the Proposed Project, and they would have adverse water quality (sedimentation) impacts. In addition, because flood flow capacities would not be maintained in these unmodified channels, flood risk may increase in these reaches.

Limited Activities Alternative

Under the Limited Activities Alternative, those maintenance activities with the greatest biological impacts would be eliminated or modified. For bank stabilization activities, no hardening of stream banks would be allowed and only “soft” stabilization measures would be used. For sediment removal activities, equipment would always be located at the top of the bank and would not be allowed in the stream channel. For vegetation management activities, no herbicide use would be allowed, and only mechanical vegetation management methods would be utilized. For management of animal conflicts, no rodenticide use would be allowed. Minor maintenance activities would be conducted as described under the Proposed Project. Relying on alternative methods would result in increased efforts to accomplish the same degree of necessary maintenance. Alternative methods also may result in higher implementation costs and/or less maintenance work getting accomplished each year.

Under the Limited Activities Alternative, the avoidance of the most impactful activities would eliminate impacts but may increase others. For instance, eliminating the use of herbicides and rodenticides would reduce the potential for impacts on water quality. However, repeated hand-vegetation removal would be likely to result in greater trampling

of vegetation/habitat than single events of herbicide application. Conducting sediment removal from the top of the stream bank may not allow for removal of sediment from certain channels that could not be accessed from the top of the bank. Therefore, this alternative would be likely to impede sediment removal that would be necessary to maintain flood flow conveyance capacity. As a result, the potential flooding risk would increase at these locations.

Furthermore, reliance on alternative methods for implementing maintenance activities could result in new and/or increased environmental impacts, compared to the Proposed Project. For instance, relying solely on mechanical vegetation management, as opposed to herbicides, could result in greater noise and air quality impacts. Finally, restricting bank stabilization to "soft" methods could result in inadequate bank protection in instances where hard methods were needed for bank stability. This could result in repeated bank failures, with adverse impacts on habitat and water quality through direct loss of riparian habitat as well as sediment discharges. The need for repeat bank repairs could increase the impacts associated with such maintenance activities (e.g., increased air emissions, noise impacts).

Comparison of Alternatives and the Environmentally Superior Alternative

Weighing all the issues, the Proposed Project is considered to be environmentally superior. Compared to any of the other alternatives, it strikes the most appropriate balance between managing flood risk, protecting the ecological integrity of the SMP channels, and addressing other short- and long-term impacts associated with proposed maintenance activities.

However, CEQA requires that an environmentally superior alternative be selected from among the alternatives to the Proposed Project. The Reduced Frequency Alternative is considered the environmentally superior alternative because by limiting the amount of all annual maintenance activities, it would reduce the impacts associated with these activities. However, this alternative would provide less overall flood protection than the Proposed Project. Although flood flow capacity would be retained in the long-term by conducting larger maintenance events, flood risk would increase in the interim because needed maintenance events would be delayed so that they occurred no more frequently than every 5 years.

The other alternatives were not selected as the environmentally superior alternative for the following reasons:

- ***No Project Alternative***. Although this alternative would provide only a slight reduction in the maintenance of the design flow or appropriate conveyance capacity of facilities, maintenance would not necessarily be conducted in a timely manner to avoid flood hazards. Furthermore, maintenance activities may not be implemented along with a comprehensive mitigation approach and consistent set of BMPs. Therefore, flood risk would be greater and, at the same time, more residual impacts would remain.

- ***Limited Work Alternative***. As a result of reduced maintenance activities in unmodified reaches, this alternative would promote the ecological structure and

function of these reaches and, therefore, would reduce a variety of impacts related to the Proposed Project in those locations. However, this alternative would result in increased flood risk along unmodified channels and resulting impacts on downstream creek systems.

- ***Limited Activities Alternative***. This alternative would slightly reduce impacts to biological resources. However, new/increased impacts also could result from the use of alternative maintenance methods. This alternative also could result in a reduction in the maintenance of the design flow or appropriate conveyance capacity of facilities where sediment removal could not occur solely from the top of the bank, and increased water quality and habitat impacts where soft bank stabilization methods were not effective.

Summary of Impacts and Levels of Significance

The impacts of the Proposed Project, proposed mitigation, and significance conclusions are discussed in detail in Chapter 3, *Environmental Setting and Impact Analysis,* and Chapter 4, *Other Statutory Considerations* of this DSEIR. Table ES-1 summarizes the impacts, mitigation measures, and levels of significance identified in this document.

Table ES-1. Summary of Potential Impacts and Mitigation Measures

Potential Impact	Level of Significance before Mitigation[1]	Mitigation Measures	Level of Significance after Mitigation[1]
Direct and Indirect Impacts			
3.1 Aesthetics			
AES-1: Alternation to a Scenic Vista	LTS	None Required	LTS
AES-2: Alteration to Scenic Resources Viewed from a State or County-designated Scenic Highway	LTS	None Required	LTS
AES-3: Temporary Alteration of Visual Character or Quality from Maintenance Activities	PS	MM BIO-1, MM BIO-2, and MM BIO-7	SU
AES-4: Permanent Alteration of Visual Character or Quality from Maintenance Activities	PS	MM BIO-1, MM BIO-2, and MM BIO-7	SU
AES-5: Substantial Alteration to Day or Nighttime Views resulting from Additional Light or Glare	NI	None Required	NI
AES-6: Impacts on Aesthetics Associated with sediment Disposal/Reuse	LTS	None Required	LTS
3.2 Air Quality			
AIR-1: Temporary Increase in ROG, NOx, PM_{10}, and $PM_{2.5}$ Emissions during Maintenance Activities	PS	MM AIR-1A: Reduction in Fleet Emissions, MM AIR-1B: Off-site NOx Emissions Mitigation Program, MM AIR-1C: NOx Emissions Offsets	LTS/SU
AIR-2: Diesel PM Health Risk during Maintenance Activities	LTS	None Required	LTS
AIR-3: Creation of Objectionable Odors	LTS	None Required	LTS
3.3 Biological Resources			
BIO-1: Loss or Disturbance of Wetlands and Other Waters	PS	MM BIO-1: Implement Compensatory Mitigation for Wetlands and Other Waters	LTS

Table ES-1. Summary of Potential Impacts and Mitigation Measures

Potential Impact	Level of Significance before Mitigation[1]	Mitigation Measures	Level of Significance after Mitigation[1]
BIO-2: Loss or Disturbance of Woody Riparian Vegetation	PS	MM BIO-2: Implement Compensatory Mitigation for Woody Riparian Vegetation	LTS
BIO-3: Disturbance of Sensitive Plant Communities	PS	MM BIO-3: Implement Compensatory Mitigation for Serpentine Communities	LTS
BIO-4: Impacts to Serpentine-Associated Special-Status Plant Species	PS	MM BIO-4: Implement Compensatory Mitigation for Serpentine-Associated Special-Status Plant Species	LTS
BIO-5: Impacts to Non-Serpentine Special-Status Plant Species	PS	MM BIO-5: Implement Compensatory Mitigation for Impacts to Non-Serpentine Special-Status Plant Species	LTS
BIO-6: Impacts to Serpentine-Associated Special-Status Invertebrates	PS	MM BIO-6: Implement Compensatory Mitigation for Impacts to Serpentine-Associated Special-Status Invertebrates	LTS
BIO-7: Loss of Ordinance Trees	PS	MM BIO-7: Tree Replacement	LTS
BIO-8: Impacts on Steelhead	PS	MM BIO-1, MM BIO-2, MM BIO-8: Augmentation of Spawning Gravel, and MM BIO-9: Augmentation of Instream Complexity for Non-Tidal Stream Fish	LTS
BIO-9: Impacts on the Pacific Lamprey and Monterey Roach	PS	MM BIO-1, MM BIO-2, and MM BIO-9	LTS
BIO-10: Impacts on the Longfin Smelt and Green Sturgeon	PS	MM BIO-1	LTS
BIO-11: Impacts on the California Tiger Salamander	PS	MM BIO-1, MM BIO-2, and MM BIO-10: Implement Compensatory Mitigation for the California Tiger Salamander	LTS
BIO-12: Impacts on the California Red-Legged Frog	PS	MM BIO-1, MM BIO-2, and MM BIO-11: Implement Compensatory Mitigation for the California Red-Legged Frog	LTS
BIO-13: Impacts on the Foothill Yellow-Legged Frog	LTS	None Required	LTS

Table ES-1. Summary of Potential Impacts and Mitigation Measures

Potential Impact	Level of Significance before Mitigation[1]	Mitigation Measures	Level of Significance after Mitigation[1]
BIO-14: Impacts on Non-Special-Status Fish and Amphibians	PS	MM BIO-1, MM BIO-2, and MM BIO-9	LTS
BIO-15: Impacts on Essential Fish Habitat	LTS	None Required	LTS
BIO-16: Impacts on the Western Pond Turtle	PS	MM BIO-1, MM BIO-2, and MM BIO-9	LTS
BIO-17: Impacts on the California Horned Lizard	LTS	None Required	LTS
BIO-18: Impacts on the Black Skimmers	LTS	None Required	LTS
BIO-19: Impacts on the Western Snowy Plover	LTS	None Required	LTS
BIO-20: Impacts on the California Clapper Rail and Alameda Song Sparrow	PS	MM BIO-1	LTS
BIO-21: Impacts on the California Black Rail and Bryant's Savannah Sparrow	LTS	None Required	LTS
BIO-22: Impacts on the San Francisco Common Yellowthroat	LTS	None Required	LTS
BIO-23: Impacts on the Least Bell's Vireo	PS	MM BIO-2, and MM BIO-12: Implement Compensatory Mitigation for the Least Bell's Vireo (MM BIO-12A or MM BIO-12B)	LTS
BIO-24: Impacts on the Burrowing Owl	PS	MM BIO-13: Implement Compensatory Mitigation for the Burrowing Owl	LTS
BIO-25: Impacts on the Golden Eagle and Bald Eagle	LTS	None Required	LTS
BIO-26: Impacts on the American Peregrine Falcon	LTS	None Required	LTS
BIO-27: Impacts on the Yellow Warbler	PS	MM BIO-2 and MM BIO-14: Implement Compensatory Mitigation for the Yellow Warbler	LTS
BIO-28: Impacts on the Yellow-Breasted Chat	PS	MM BIO-12 (MM BIO-12A or MM BIO-12B)	LTS

Table ES-1. Summary of Potential Impacts and Mitigation Measures

Potential Impact	Level of Significance before Mitigation[1]	Mitigation Measures	Level of Significance after Mitigation[1]
BIO-29: Impacts on the Grasshopper Sparrow	LTS	None Required	LTS
BIO-30: Impacts on the Northern Harrier	LTS	None Required	LTS
BIO-31: Impacts on the White-tailed Kite and Loggerhead Shrike	LTS	None Required	LTS
BIO-32: Impacts on the Redhead, Short-Eared Owl, Long-Eared Owl, Vaux's Swift, and Olive-Sided Flycatcher	LTS	None Required	LTS
BIO-33: Impacts on the Tricolored Blackbird	LTS	None Required	LTS
BIO-34: Impacts on Non-Breeding, Special-Status Birds	LTS	None Required	LTS
BIO-35: Impacts on the Salt Marsh Harvest Mouse and Salt Marsh Wandering Shrew	PS	MM BIO-1	LTS
BIO-36: Impacts on the San Francisco Dusky-Footed Woodrat	LTS	None Required	LTS
BIO-37: Impacts on the Pallid Bat	PS	MM BIO-15: Provide Alternative Bat Roost	LTS
BIO-38: Impacts on the Western Red Bat and Townsend's Big-Eared Bat	LTS	None Required	LTS
BIO-39: Impacts on Non-Special-Status Bats	LTS	None Required	LTS
BIO-40: Impacts on the San Joaquin Kit Fox	LTS	None Required	LTS
BIO-41: Impacts on the American Badger and Ringtail	LTS	None Required	LTS
BIO-42: Impacts on the Mimic Tryonia	LTS	None Required	LTS
BIO-43: Impacts on the Pacific Harbor Seal	LTS	None Required	LTS
BIO-44: Introduction of Invasive Species	PS	MM BIO-16: Invasive Plant Species Management Program	LTS

Table ES-1. Summary of Potential Impacts and Mitigation Measures

Potential Impact	Level of Significance before Mitigation[1]	Mitigation Measures	Level of Significance after Mitigation[1]
BIO-45: Habitat Fragmentation	SU	None Available	SU
BIO-46: Conflicts with Adopted Habitat Conservation Plans or Natural Community Conservation Plans	LTS	None Required	LTS
BIO-47: Resuspension of Mercury	LTS	None Required	LTS
3.4 Cultural Resources			
CR-1: Disturbance to Known and Previously Undiscovered Archaeological or Historic Resources	LTS	None Required	LTS
CR-2: Discovery of Human Remains	LTS	None Required	LTS
CR-3: Impacts to Sensitive Paleontological Resources as a Result of Maintenance Activities	LTS	None Required	LTS
3.5 Global Climate Change			
GCC-1: Temporary Increase in GHGs during Maintenance Activities	PS	MM AIR-1A and MM GCC-1A: On-site or Off-site GHG Emissions Mitigation Program, or MM GCC-1B: GHG Emissions Offsets	LTS/SU
3.6 Hazards and Hazardous Materials			
HAZ-1: Use, Transport, or Accidental Release of Hazardous Materials such that a Significant Hazard to the Public or Environment Would Result	LTS	None Required	LTS
HAZ-2: Potential to Interfere with Emergency Response	LTS	None Required	LTS
HAZ-3: Be Located on a Known Existing Contaminated Site	LTS	None Required	LTS
HAZ-4: Be Located on a Previously	LTS	None Required	LTS

Table ES-1. Summary of Potential Impacts and Mitigation Measures

	Potential Impact	Level of Significance before Mitigation[1]	Mitigation Measures	Level of Significance after Mitigation[1]
	Undiscovered Contaminated Site			
HAZ-5:	Create Safety Hazards or Releases of Hazardous Materials in Proximity to a School	LTS	None Required	LTS
HAZ-6:	Exacerbate Wildland Fires	LTS	None Required	LTS
HAZ-8:	Disposal of Contaminated Sediments	LTS	None Required	LTS
3.7 Hydrology and Geomorphology				
HYD-1:	Short-Term Instream Erosion or Sedimentation from Sediment Management Activities	LTS	None Required	LTS
HYD-2:	Long-Term Instream Erosion or Sedimentation from Sediment Removal Activities	B	None Required	B
HYD-3:	Short-Term Erosion or Sedimentation from Vegetation Management Activities	LTS	None Required	LTS
HYD-4:	Short-Term Erosion, or Sedimentation from Bank Stabilization Activities	LTS	None Required	LTS
HYD-5:	Long-Term Erosion and Sedimentation from Vegetation Management and Bank Stabilization Activities	B	None Required	B
HYD-6:	Harm to People, Structures, or Water Quality from Flooding	B	None Required	B
HYD-7:	Alterations to the Recharge, Quality, or Quantity of Groundwater	B	None Required	B
HYD-8:	Occurrence of Seiche, Tsunami, or Mudflow	NI	None Required	NI

Table ES-1. Summary of Potential Impacts and Mitigation Measures

Potential Impact	Level of Significance before Mitigation[1]	Mitigation Measures	Level of Significance after Mitigation[1]
HYD-9: Geomorphic Effects of Sediment Reuse	LTS	None Required	LTS
HYD-10: Creation of Runoff Water and Depletion of Surface Water Supplies	LTS	None Required	LTS
HYD-11: Short-Term Erosion and Sedimentation from Minor Maintenance, Management of Animal Conflicts, and Canal Maintenance Activities	B	None Required	B
HYD-12: Long-Term Erosion and Sedimentation from Minor Maintenance, Management of Animal Conflicts, and Canal Maintenance Activities	B	None Required	B
3.8 Land Use and Planning			
LU-1: Division of Existing Neighborhoods or Communities	LTS	None Required	LTS
LU-2: Incompatibility with Adjacent Land Uses	LTS	None Required	LTS
LU-3: Compatibility with Land Use Plans and Policies	LTS	None Required	LTS
3.9 Noise			
NZ-1: Temporary Exposure of the Public to Noise Levels in Excess of City or County Standards	PS	None Available	SU
NZ-2: Generate Groundborne Vibrations	NI	None Required	NI

Table ES-1. Summary of Potential Impacts and Mitigation Measures

Potential Impact	Level of Significance before Mitigation[1]	Mitigation Measures	Level of Significance after Mitigation[1]
NZ-3: Temporary Substantial Increase in Noise above Ambient Levels	PS	None Available	SU
3.10 Public Services and Utilities			
PSU-1: Effects on Public Facilities and Services	LTS	None Required	LTS
PSU-2: Disruption to Utilities and Service System Facilities	LTS	None Required	LTS
PSU-3: Insufficient Available Water Supplies resulting in the Need for New or Additional Water Supply or Distribution Facilities	LTS	None Required	LTS
PSU-4: Disposal of Excavated Sediment and Other Materials at Off-Site Locations, including Landfills	LTS	None Required	LTS
3.11 Recreation			
REC-1: Temporary Disturbance of Recreational Quality	LTS	None Required	LTS
REC-2: Permanent Changes to Recreation Quality	B	None Required	B
REC-3: Temporary Disruption of the Use of, or Access to, Recreational Facilities	LTS	None Required	LTS
REC-4: Permanent Use or Access Disruption of Recreational Facilities	NI	None Required	NI
3.12 Traffic and Transportation			
TR-1: Increase in Vehicle Miles Traveled	LTS	None Required	LTS
TR-2: Substantial Increase in Safety Hazards	LTS	None Required	LTS
TR-3: Inadequate Emergency Access	LTS	None Required	LTS

Table ES-1. Summary of Potential Impacts and Mitigation Measures

Potential Impact		Level of Significance before Mitigation[1]	Mitigation Measures	Level of Significance after Mitigation[1]
TR-4:	Disruption of Alternative Transportation Facilities or Services	LTS	None Required	LTS
TR-5:	Insufficient Parking Capacity	LTS	None Required	LTS
3.13 Water Quality				
WQ-1:	Water Quality Degradation Resulting in Violation of Water Quality Standards or Waste Discharge Requirements Caused by Ground-Disturbing Activities	LTS	None Required	LTS
WQ-2:	Water Quality Degradation Resulting in Violation of Water Quality Standards or Waste Discharge Requirements Caused by Instream Maintenance Activities	LTS	None Required	LTS
WQ-3:	Water Quality Degradation Resulting in Violation of Water Quality Standards or Waste Discharge Requirements Caused by the Accidental Release of Hazardous Materials	LTS	None Required	LTS
WQ-4:	Water Quality Degradation Resulting in Violation of Water Quality Standards or Waste Discharge Requirements Caused by the Use of Pesticides, including Herbicides	LTS	None Required	LTS
WQ-5:	Water Quality Degradation Resulting in Violation of Water Quality Standards or Waste Discharge Requirements Caused by the Disturbance of Existing Contamination	LTS	None Required	LTS

Table ES-1. Summary of Potential Impacts and Mitigation Measures

Potential Impact	Level of Significance before Mitigation[1]	Mitigation Measures	Level of Significance after Mitigation[1]
WQ-6: Compliance with CWA Section 303(d) Total Maximum Daily Loads	LTS	None Required	LTS
WQ-7: Water Quality Degradation Resulting in Violation of Water Quality Standards or Waste Discharge Requirements Caused by Sediment Handling and Disposal	LTS	None Required	LTS
WQ-8: Create or Contribute Runoff Water that Would Provide Substantial Additional Sources of Polluted Runoff	B	None Required	B
WQ-9: Alterations to the Quality of Groundwater	B	None Required	B
Cumulative Impacts			
AIR-1: Emissions of ROG, NOx, PM_{10}, and $PM_{2.5}$	PS	MM AIR-1A, MM AIR-1B, and MM AIR-1C	LTS/SU
AIR-2: Emissions of Greenhouse Gases	PS	MM AIR-1A, and MM GCC-1A or MM GCC-1B	LTS/SU
BIO-1: Effects on Biological Resources	PS	MM BIO-1, MM BIO-2, MM BIO-3, MM BIO-4, MM BIO-5, MM BIO-6, MM BIO-7, MM BIO-8, MM BIO-9, MM BIO-10, MM BIO-11, MM BIO-12, MM BIO-13, MM BIO-14, MM BIO-15, and MM-BIO-16	LTS
BIO-2: Habitat Fragmentation	PS	None Available	SU
CR-1: Effects on Cultural Resources	LTS	None Required	LTS
LU-1: Land Use Conflicts	LTS	None Required	LTS
NZ-1: Project-Related Noise Emissions	LTS	None Required	LTS
TR-1: Disruption to Automobile Traffic Patterns	LTS	None Required	LTS
PSU-1: Effects on Public Services and Utilities	B	None Required	B
WQ-1: Effects on Water Quality	LTS	None Required	LTS

[1] Definitions:

B	Beneficial
LTS	Less-than-Significant
NI	No Impact
PS	Potentially Significant
SU	Significant and Unavoidable

Source: Compiled by Horizon Water and Environment in 2011

Chapter 1
INTRODUCTION

The Santa Clara Valley Water District (SCVWD) has prepared this Draft Subsequent Environmental Impact Report (DSEIR) to provide the public, responsible agencies, and trustee agencies with information about the potential environmental effects of the proposed Stream Maintenance Program (SMP) Update (SMP Update or Proposed Project). This DSEIR was prepared in compliance with the California Environmental Quality Act (CEQA) of 1970 (as amended) and the State CEQA Guidelines (14 California Code of Regulations [CCR]) 15000 et seq.).

1.1 General Background

SCVWD is a special district created by the State Legislature to act not only as Santa Clara County (County)'s water wholesaler but also as its flood protection agency and the steward for its streams and creeks, underground aquifers, and SCVWD-built reservoirs. SCVWD carries out its responsibilities in an environmentally responsible and cost effective manner, led by a Board of Directors composed of seven members, each elected from geographical areas within the county.

As the County's water wholesaler, SCVWD ensures a dependable supply of clean, safe water for homes and businesses. As the agency responsible for local flood protection, the SCVWD works diligently to protect Santa Clara Valley residents and businesses from the devastating effects of flooding. SCVWD's stream stewardship includes creek restoration and wildlife habitat projects, mitigation monitoring, pollution prevention efforts, and a commitment to natural flood protection.

1.2 Proposed Project Background

SCVWD is responsible for water supply, flood protection, and stream stewardship in Santa Clara County, California. SCVWD manages streams, canals, reservoirs, dams, pipelines, groundwater percolation facilities, and water treatment plants throughout the county to fulfill its responsibilities. SCVWD-owned flood protection facilities require maintenance to ensure that the designed function of each facility is maintained. Before 2002, SCVWD conducted maintenance activities as needed. In 2002, SCVWD implemented the SMP as an ongoing program with an indefinite time horizon to guide routine maintenance activities within SCVWD's creeks and canals. The difference between stream maintenance conducted before the SMP (pre-2002) and the initial SMP (2002–2012) is the SMP's comprehensive approach to managing and tracking the maintenance work and costs, its monitoring of environmental conditions, and its mitigating for the program as a whole, rather than on an individual project basis. The SMP is used by SCVWD staff to ensure that routine stream maintenance practices are conducted in an efficient, consistent, and environmentally sensitive manner.

Although the SMP is an ongoing program, the initial 2002 SMP Manual and Final Environmental Impact Report used a 20-year planning horizon to forecast SMP activities ~~and consider potential environmental effects~~. In 2009, SCVWD initiated an SMP Update process to renew necessary SMP permits as well as to review and update the SMP Manual and environmental compliance documentation. For the purposes of regulatory permitting, ~~T~~the SMP Update (including the 2012 SMP manual and this CEQA document) is intended to cover the 10-year planning period beginning in 2012 and ending in 2022. These SMP Update documents are intended to fully replace the original documents that guided the SMP from its inception through 2011. In general, the SMP Update is a continuation of past routine creek and canal maintenance activities in most of the same areas, using many of the same techniques. The SMP Update includes some new work areas and new work activities. More details regarding the SMP Update are provided in Chapter 2, *Project Description.*

The 2012 SMP Manual (included as Appendix A in this DSEIR) and the contents of the DSEIR are meant to be read as complementary volumes. As such, the DSEIR references or summarizes information presented in the 2012 SMP Manual frequently to avoid repeating information. The reader is encouraged to review the 2012 SMP Manual while reviewing the DSEIR.

1.3 Overview of CEQA Requirements and the 2002 SCVWD Stream Maintenance Program EIR

CEQA is the cornerstone of environmental law and policy in California. CEQA's primary objectives are to (State CEQA Guidelines Section 15002):

- ensure that the significant environmental effects of proposed activities are disclosed to decision makers and the public;
- identify ways to avoid or reduce environmental damage; prevent environmental damage by requiring implementation of feasible alternatives; and avoid, minimize, reduce and/or compensate for environmental impacts through implementation of mitigation measures;
- disclose the reasons for agency approval of projects with significant environmental effects;
- foster multidisciplinary interagency coordination in the review of projects; and
- allow for public participation in the planning process.

With certain strictly limited exceptions, CEQA requires all state and local government agencies to consider the environmental consequences of projects over which they have discretionary authority before taking action on those projects. It establishes both procedural and substantive requirements that agencies must satisfy to meet CEQA's objectives. For example, the agency with decision-making authority (the lead agency) must first assess whether a proposed project would result in significant environmental impacts. If the project could result in significant environmental impacts, CEQA requires that the agency prepare an environmental impact report (EIR), analyzing both the proposed project and a range of feasible alternatives.

As described in Section 15121(a) of the State CEQA Guidelines, an EIR is a public information document that assesses potential environmental effects of a proposed project as well as identifies mitigation measures and alternatives to the project that could reduce or avoid adverse environmental impacts (14 CCR 15121[a]). Other key procedural requirements include developing a plan for mitigation measure reporting and monitoring, and carrying out specific noticing and distribution steps to facilitate public involvement in the environmental review process.

In 2001, for its SMP the SCVWD complied with CEQA through a comprehensive evaluation and disclosure of potential environmental effects. This included the preparation of a public Draft Environmental Impact Report (DEIR) and a Final Environmental Impact Report (FEIR), which incorporated public comments and responses to comments on the DEIR. A Notice of Determination was filed on July 12, 2002 with the State Clearinghouse (SCH No. 200102055), completing the CEQA review requirements for the SMP. The requirements and policies of the SMP were finalized in 2002 when SCVWD received authorizations from all the permitting agencies with jurisdiction over the program, as shown in Table 2-10 in Chapter 2, *Project Description*.

1.3.1 CEQA Requirements for Subsequent EIR

The SMP that was evaluated in SCVWD's certified 2002 EIR was intended to be implemented indefinitely and, under ordinary circumstances, the EIR should have been sufficient to cover implementation of the SMP indefinitely.

According to Section 15162 of the State CEQA Guidelines, when an EIR has been certified for a project, no subsequent EIR shall be prepared for that project unless the lead agency determines, on the basis of substantial evidence in the light of the whole record, one or more of the following:

- Substantial changes are proposed in the project which will require major revisions of the previous EIR due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects;

- Substantial changes occur with respect to the circumstances under which the project is undertaken which will require major revisions of the previous EIR due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects; or

- New information of substantial importance, which was not known and could not have been known with the exercise of reasonable diligence at the time the previous EIR was certified as complete shows any of the following:
    - The project will have one or more significant effects not discussed in the previous EIR;
    - Significant effects previously examined will be substantially more severe than shown in the previous EIR;
    - Mitigation measures or alternatives previously found not to be feasible would in fact be feasible, and would substantially reduce one or more significant effects of the project, but the project proponents decline to adopt the mitigation measure or alternative; or
    - Mitigation measures or alternatives which are considerably different from those analyzed in the previous EIR would substantially reduce one or more significant effects on the environment, but the project proponents decline to adopt the mitigation measure or alternative.

Section 15162 also states that a subsequent EIR shall be given the same notice and public review as required under Section 15087 or Section 15072. A subsequent EIR shall state where the previous document is available and can be reviewed.

SCVWD has determined that its 2002 SMP and related circumstances have changed substantially enough that the preparation of a Subsequent EIR is appropriate. Specifically, the following changes to the SMP contributed to this decision:

- Maintenance activities are being proposed in new locations not included in the 2002 SMP.
- At some existing locations, different types of maintenance activities are now being proposed.
- New maintenance activities are being proposed.
- SCVWD is proposing a modified approach to mitigation than what was adopted under the 2002 EIR.

In addition, several changes in the physical and regulatory environment have occurred, as follows:

- Several species are now listed as threatened or endangered under either the California or federal Endangered Species Act that were not listed in 2002.
- CEQA has been updated with additional requirements regarding the analysis of greenhouse gas emissions and global climate change.

1.4 Public Involvement Process

As described above, public disclosure and dialogue are priorities under CEQA. Accordingly, CEQA mandates two periods during the SEIR process when public and agency comments on the impacts of the Proposed Project are solicited: during the scoping comment period, and during the review period for the DSEIR. CEQA and the State CEQA Guidelines also encourage lead agencies to hold public meetings or hearings to review both the draft and final versions of an SEIR. Brief descriptions of these milestones are provided below, as they apply to this document.

1.4.1 Scoping Comment Period

Scoping refers to the public outreach process used under CEQA to determine the coverage and content of an SEIR. The scoping comment period offers an important opportunity for public review and comment in the early phases of a project. The scoping process for an SEIR is typically initiated by publication of the Notice of Preparation (NOP) required by CEQA, which provides formal notice to the public and to interested agencies and organizations that a DSEIR is in preparation. During the scoping period, agencies and the public are invited to comment on the project, the approach to environmental analysis, and any issues of concern to be discussed in the DSEIR. Scoping also can assist the lead agency with identification of project alternatives and mitigation measures. CEQA does not require public meetings during the scoping phase.

In accordance with State CEQA Guidelines (14 CCR 15082[a], 15103, 15375), SCVWD circulated an NOP for the Proposed Project on August 31, 2010 (Appendix B). The NOP, in which SCVWD was identified as lead agency for the Proposed Project, was circulated to the public; to local, state, and federal agencies; and to other interested parties. The purpose of the NOP was to inform responsible agencies and the public that the Proposed Project could have significant effects on the environment and to solicit their comments so that any concerns raised could be considered during the preparation of the DSEIR. In addition, SCVWD held a public scoping meeting on September 22, 2010, to provide the public with another opportunity to comment. Comments received in response to the NOP are included in Appendix B, and the preparers of this DSEIR considered these comments. No comments were received at the public scoping meeting.

1.4.2 ~~Draft EIR~~DSEIR Comment Period

After the DSEIR is completed, the District will issue a notice of availability, providing agencies and the public with formal notification that the document is available for review. The notice will be sent to the State CEQA Clearinghouse, all responsible and trustee agencies, any person or organization requesting a copy, and the county clerk's office for posting. The notice also will be published in a general-circulation newspaper. These actions will trigger a 45-day public review period, during which the District will receive and collate public and agency comments on the project and the document.

SCVWD will host a public hearing approximately 30 days after release of the document. The purpose of public circulation and the public hearings are to provide agencies and interested

individuals with opportunities to comment on or express concerns regarding the contents of the DSEIR.

For those interested, written comments or questions concerning this DSEIR can be submitted within this review period and directed to the name and address listed below. Submittal of written comments via e-mail (Microsoft Word format) will be greatly appreciated.

Santa Clara Valley Water District
Attention: Sunny Williams
5750 Almaden Expressway
San Jose, CA 95118-3686

E-mail: smp_update@valleywater.org
Subject Line: SMP Update EIR Comments

All documents mentioned herein or related to the Proposed Project can be reviewed on any SCVWD business day between the hours of 8:00 a.m. and 5:00 p.m. Monday through Friday at SCVWD headquarters, located at the address shown above, or on the SCVWD Web site at www.valleywater.org under Quick Links, Public Review docs. The documents also will be available at the libraries listed below during their normal operating hours.

Dr. Martin Luther King, Jr. Library
150 E. San Fernando Street
San Jose, CA 95112

Morgan Hill Public Library
660 W. Main Avenue
Morgan Hill, CA 95037

Palo Alto Public Library
1213 Newell Road
Palo Alto, CA 94303

Cupertino Public Library
10800 Torre Avenue
Cupertino, CA 95014-3207

Milpitas Public Library
160 N. Main Street
Milpitas, CA 95035

Alviso Library
5050 N. 1st St.
San Jose, CA 95134

Written and oral comments received in response to the DSEIR will be addressed in the Final Subsequent Environmental Impact Report (FSEIR), which will include all comments received, responses to each, and a reprint of the DSEIR, updated as appropriate in underline/~~strikeout~~ in response to the comments.

1.4.3 Preparation of ~~Final EIR~~FSEIR and Public Hearing

CEQA requires the lead agency to prepare an FSEIR, addressing all substantive comments received on the DSEIR before approving a project. The FSEIR must include a list of all individuals, organizations, and agencies that provided comments on the DSEIR, and must contain copies of all comments received during the public review period along with the lead agency's responses.

After review of the FSEIR, SCVWD staff will recommend to the SCVWD Board of Directors whether to approve or deny the Proposed Project. This governing body then will review the FSEIR, consider SCVWD staff recommendations and public testimony, and decide whether to certify the FSEIR and approve or deny the Proposed Project.

If significant impacts are identified in the SEIR that cannot be mitigated, a statement of overriding considerations must be included in the record of the Proposed Project approval and mentioned in the Notice of Determination, to be filed with the State Office of Planning and Research and at the office of the County Clerk (14 CCR 15093[c]).

1.5 Organization of this DSEIR

This DSEIR contains the following components:

Table of Contents. The Table of Contents include an outline of the document, lists of the appendices, tables, and figures, acronyms, and a glossary of significant terms.

Executive Summary. A summary of the Proposed Project, a description of the issues of concern, alternatives to the Proposed Project, and a summary of environmental impacts are provided.

Chapter 1, *Introduction*. This chapter describes the statutory basis, purpose, and organization of the DSEIR and its preparation, review, and certification process.

Chapter 2, *Project Description*. This chapter summarizes the Proposed Project, including: a description of the Proposed Project purpose and goals; a brief description of the Proposed Project area and facilities where the SMP is implemented; the Proposed Project approach and activities; Proposed Project implementation and oversight; avoidance and minimization measures (best management practices); and required permits and approvals.

Chapter 3, *Environmental Setting and Impact Analysis*. This chapter begins with an introductory section which identifies resource areas determined not to be affected by the Proposed Project. Chapter 3 then presents thirteen sections that describe existing environmental conditions, the Proposed Project's anticipated environmental impacts, and

mitigation measures proposed for any significant impacts. The following resource topics are addressed these sections:

3.1 Aesthetics

3.2 Air Quality

3.3 Biological Resources

3.4 Cultural Resources

3.5 Global Climate Change

3.6 Hazards and Hazardous Materials

3.7 Hydrology and Geomorphology

3.8 Land Use and Planning

3.9 Noise

3.10 Public Service and Utilities

3.11 Recreation

3.12 Traffic and Transportation

3.13 Water Quality

Chapter 4, *Other Statutory Considerations.* This chapter addresses the Proposed Project's potential to contribute to cumulative impacts in the Project Area. Chapter 4 also outlines the Proposed Project's potential to induce growth and identifies significant, irreversible environmental changes that could result from implementation of the Proposed Project.

Chapter 5, *Alternatives Analysis.* This chapter describes the process through which alternatives to the Proposed Project were developed and screened, evaluates their likely environmental impacts, and identifies the environmentally superior alternative.

Chapter 6, *Report Preparation.* This chapter lists the individuals involved in preparing this DSEIR and their responsibilities.

Chapter 7, *References.* This chapter provides a bibliography of printed references, Web sites, and personal communications used in preparing this DSEIR.

Appendix A 2012 Stream Maintenance Program Manual

Appendix B Notice of Preparation and Comments Received

Appendix C 2012–2022 SMP Update Mitigation Approach Memorandum

Appendix D General Plan Policies and Ordinances

Appendix E Air Quality and Greenhouse Gas Emissions Calculations

Appendix F Taxonomic Crosswalk between the Jepson Manual First Edition and Second Edition (second edition in preparation)

Appendix G Special-Status and Locally Significant Plant Species Considered but Rejected for Occurrence in the Project Area

Appendix H Detailed Descriptions of Special-Status and Locally Significant Plant Species Potentially Occurring in the Project Area

Appendix I Detailed Descriptions of Special-Status Wildlife Species Potentially Occurring in the Project Area

Appendix J Pesticide Regulatory Information

Appendix K Traffic and Transportation Calculations

Appendix L Mitigation Monitoring and Reporting Program

Appendix M Fish Relocation Guidelines

1.6 Impact Terminology

This DSEIR uses the following terminology to describe the environmental effects of the Proposed Project.

- A finding of no impact is made when the analysis concludes that the Proposed Project would not affect the particular environmental resource or issue.

- An impact is considered less than significant if the analysis concludes that a substantial adverse change in the environment related to this impact would not occur and, therefore, no mitigation is needed.

- An impact may be considered significant or potentially significant if the analysis determines that a substantial adverse effect on the environment could occur. Depending on the nature of the impact and feasibility of mitigation which could be implemented, such impacts would result in one of the following two conclusions:

    - An impact is considered less than significant with mitigation if the analysis concludes that a substantial adverse change in the environment related to this impact would not occur with the inclusion of the mitigation measures described.

- An impact is considered significant and unavoidable if the analysis concludes that a substantial adverse effect on the environment related to this impact could occur and no feasible mitigation measures are available to reduce the impact to a less-than-significant level.

- An impact is considered *beneficial* if the analysis concludes that a positive change in the environment would occur related to this impact.

- *Mitigation* refers to specific measures or activities adopted to avoid or substantially reduce a significant impact.

- A *cumulative impact* is the environmental change resulting from the incremental impact of a project when added to other related past, present, or reasonably foreseeable future projects. Significant cumulative impacts may result from individually minor but collectively significant projects.

Chapter 2
PROJECT DESCRIPTION

2.1 Introduction

Since the summer work season of 2002, SCVWD has implemented the SMP to guide routine maintenance activities within its creeks and canals. In 2009, SCVWD initiated the SMP Update process to: 1) review SMP activities and revise the program manual, 2) update its environmental compliance documentation, and 3) renew necessary SMP permits.

Although the SMP is an ongoing, continuous program (with an indefinite time horizon), the 2002 SMP Manual and Final Environmental Impact Report used a 20-year planning horizon to forecast SMP activities ~~and consider potential environmental effects~~. The proposed SMP Update (including the revised SMP manual and this document) is intended to address~~cover~~ the 10-year planning period from 2012–2022 for the purposes of regulatory permitting. The updated SMP documents are intended to fully replace the original documents that have guided the SMP from its inception in 2002 through the present.

2.1.1 Project Purpose

As discussed in Chapter 1, *Introduction*, SCVWD has prepared this Draft Subsequent Environmental Impact Report (DSEIR) to provide the public, responsible agencies, and trustee agencies with information about the potential environmental effects associated with the adoption and implementation of the updated SMP for the 2012–2022 period. The SMP was developed to provide guiding policies, specific direction on approach, and regulatory authorization for routine stream and canal maintenance. The SCVWD Board of Directors (SCVWD Board) adopted a series of Ends Policies to guide SCVWD activities toward achieving SCVWD's mission. The SMP integrates several of the Ends Policies in order to guide staff in conducting routine maintenance activities and to provide the foundation for obtaining regulatory authorizations. The SMP supports updates, as necessary, to meet new conditions or maintenance needs of SCVWD.

Applicable Ends Policies of the Board of Directors (as of ~~June 2010~~July 2011)

E-1 Mission and General Principles

The mission of SCVWD is to provide for a healthy, safe, and enhanced quality of living in Santa Clara County through watershed stewardship and comprehensive management of water resources in a practical, cost-effective, and environmentally-sensitive manner for current and future generations.

E-2 Water Supply: There is a reliable, clean water supply for current and future generations.

Goal 2.1 Current and future water supply for municipalities, industries, agriculture and the environment is reliable.

Objective 2.1.1 Aggressively protect groundwater ~~basins~~ from the threat of contamination and maintain and develop~~the~~ groundwater ~~basins~~to optimize reliability and to minimize land subsidence and salt water intrusion.

Objective 2.1.2 Protect, maintain and develop local surface water.

E-3 Natural Flood Protection: There is a healthy and safe environment for residents, businesses and visitors, as well as for future generations.

Goal 3.1 Natural flood protection for residents, businesses and visitors

Objective 3.1.1 Balance environmental quality and protection from flooding. ~~in a cost effective manner~~

Objective 3.1.2 Preserve flood conveyance capacity.

E-4 Water Resources Stewardship: There is water resources stewardship to protect and enhance watersheds and natural resources and to improve the quality of life in Santa Clara County.

Goal 4.1 Healthy creek, ~~and~~ bay and other aquatic ecosystems

Objective 4.1.1 Balance water supply, flood protection and environmental stewardship functions.

Objective 4.1.2 Protect and improve watersheds, streams, and natural resources.

Objective 4.1.3 Promote ~~awareness~~the protection of aquatic~~creek and bay~~ ecosystem functions.

Goal 4.2 Clean, safe water in creeks and bay

Objective 4.2.1 Preserve or improve surface and ground water quality for beneficial uses.

Objective 4.2.2 Promote ~~awareness~~the protection of water quality and stream stewardship.

District Mission and the SMP

Flood protection under the SMP is an integral part of SCVWD's mission, integrating the efficient management of SCVWD assets within the context of environmental requirements (Ends Policy E-1). Creek maintenance preserves flow capacity of SCVWD creeks to reduce the risk of flooding, and improves water quality through the stabilization of eroding creek banks and removal of excess sediment (Ends Policies E-3.1 and E-4.2).

Maintenance of canals ensures that water conveyance systems are functioning, sustainable, and able to move water between reservoirs, creeks, percolation ponds, and water treatment plants (Ends Policy E-2.1). Water released into creeks and percolation ponds helps to replenish local groundwater aquifers and manage environmental needs (Ends Policy E-2.1).

SMP mitigation measures are designed to avoid, minimize, or mitigate potential impacts in balance with the need to conduct work in creeks and canals while carrying out SCVWD's mission.

2.1.2 Project Objectives

The overall flood management goals of the SMP Update are to maintain the design flow or appropriate conveyance capacity of SCVWD facilities, and to maintain the structural and functional integrity of SCVWD facilities. To meet these goals and to implement the applicable ends policies described above, the SMP Update would prioritize and administer maintenance activities to achieve the following objectives:

- remove sediment to maintain the hydraulic, safety, and habitat functions of the creek systems;
- manage vegetation to maintain the hydraulic, safety, and habitat functions of the creek systems, and to allow for levee inspections and maintenance access;
- stabilize beds and banks of creeks and canals to protect existing infrastructure, maintain public safety, reduce sediment loading, protect water quality, and protect habitat values; and
- avoid, minimize, or mitigate impacts on the environment by incorporating stream stewardship measures into maintenance activities.

The SMP Update also seeks to obtain and maintain multi-year programmatic permits to regulate Proposed Project activities.

2.1.3 Project Background

SCVWD is responsible for water supply, flood protection, and stream stewardship in Santa Clara County, California. SCVWD manages streams, canals, reservoirs, dams, pipelines, groundwater percolation facilities, and water treatment plants throughout the county to fulfill its responsibilities. SCVWD flood protection facilities require maintenance to maintain the designed function of each facility. The routine activities covered by the existing SMP are undertaken on SCVWD property and easements in streams, canals, levees, and adjacent property. The principal maintenance activities are:

- Bank stabilization
- Sediment removal
- Vegetation management
- Management of animal conflicts
- Minor maintenance

Historically, SCVWD has implemented these activities as needed. Therefore, the SMP Update would be a continuation of past routine creek and canal maintenance activities in most of the same areas using many of the same techniques. The difference between stream maintenance conducted before the SMP (pre-2002), and the initial SMP period (2002–2012), is the SMP Update's comprehensive approach to managing and tracking the maintenance work and costs, monitoring environmental conditions, and providing program mitigation. The SMP Update would be used by SCVWD staff to conduct routine stream maintenance practices in an efficient, consistent, and environmentally-sensitive manner.

The existing SMP complied with the requirements of CEQA through a comprehensive evaluation and disclosure of potential environmental effects. This included the preparation of a public Draft Environmental Impact Report (DEIR) and a Final Environmental Impact Report (FEIR), which incorporated public comments and responses to comments on the DEIR. A Notice of Determination was filed on July 12, 2002 with the State Clearinghouse (SCH No. 200102055), completing the CEQA review requirements for the SMP. The requirements and policies for the existing SMP document were finalized in 2002, when SCVWD received authorizations from all the permitting agencies with jurisdiction over the program. Work under the existing SMP began in 2002.

Tables 2-1 and 2-2 summarize sediment removal and vegetation management work conducted in the SMP's first decade. The tables compare the sediment removal and vegetation maintenance work originally projected for the 2002–2012 period with the actual work conducted to date between 2002 and 2009. As shown in the tables, projected sediment removal activities were greatly overestimated. Table 2-3 summarizes the bank stabilization work conducted during 2002–2009. Bank stabilization work was not projected as it was uncertain where such work would be needed until after the winter season occurred. Table 2-11, at the end of this chapter, highlights key differences between the Proposed Project that is being evaluated in this document, and the SMP adopted in 2002.

Table 2-1. Sediment Removal, 2002–2009

Watershed	Length (miles)			Volume Removed (cubic yards)		
	Projected Work 2002–2012	Actual Work (2002–2009)		Projected Work 2002–2012	Actual Work (2002–2009)	
		Work Completed[1]	Avg Annual[2]		Work Completed	Avg Annual
Santa Clara Basin	47	28.21	3.53	730,700	364,018	45,502
Pajaro Basin	11	4.13	0.52	64,900	7,274	909
Total	**58**	**32.34**	**4.04**	**795,600**	**371,292**	**46,411**

Notes:

1. Certain locations may have been the subject of sediment removal more than once during 2002-2009, but their lengths are only counted once in this column.
2. In contrast with (1) above, the average annual length as presented on this table considers locations of repeat work.

Source: Data compiled by Horizon Water and Environment in 2011

Table 2-2. Vegetation Management, 2002–2009

Watershed	Channel Hand Removal			Herbicide Application		
	Projected Work (miles) 2002–2012	Actual Work (2002–2009)		Projected Work (miles) 2002–2012	Actual Work (2002–2009)	
		Work Length Completed[1]	Avg Annual Work Length[2]		Work Length Completed	Avg Annual
Santa Clara Basin	44	28.49	3.56	183	172.86	21.6
Pajaro Basin	16	18.25	2.28	0	0	0
Stream Total[3]	**60**	**46.74**	**5.84**	**183**	**172.86**	**21.6**

Notes:

1. Certain locations may have been the subject of ~~sediment~~ channel hand-removal more than once during the 2002-2009 period, but their lengths are only counted once in this column.
2. In contrast with (1) above, the average annual length as presented on this table considers locations of repeat work.
3. Canals are included in lengths

Source: Data compiled by Horizon Water and Environment in 2011

Table 2-3. Bank Stabilization, 2002–2009

Watershed	Length (feet)			Total Work Completed (miles)	Avg Annual (miles)
	Hardscape	Softscape	In-Kind Repair		
Santa Clara Basin	7,373	24,621	1	6.06	0.76
Pajaro Basin	10	1,063	6,403	1.42	0.18
Total	**7,383**	**25,684**	**6,404**	**7.48**	**0.94**

Source: Data compiled by Horizon Water and Environment in 2011

2.1.4 Project Area

The Project Area includes the portions of Santa Clara County below the 1,000-foot elevation contour, as shown in Figure 2-1. SCVWD maintains only those sections of creeks and canals where it has fee title or maintenance easements (including property and easements that will be acquired in the future), or where the SCVWD Board has provided specific direction. The maintenance work area is the stream channel or canal itself, and typically extends past the top-of-bank, where access is provided. Where levees have been constructed, the work area extends at least to the outside toe of the levee.

As shown in Figure 2-1, SCVWD is divided into two major hydrologic basins (watersheds): the Santa Clara Basin drains to San Francisco Bay, and the Pajaro River Basin drains to the Monterey Bay. The Santa Clara Basin encompasses approximately 716 square miles. The Pajaro River Basin covers approximately 1,300 square miles, of which only 370 square miles is within Santa Clara County. The Project Area consists of 315 named rivers, streams, channels, drains and ditches, and 7 canals. Figures 2-2 through 2-6 (provided at the end of this chapter) provide more detailed maps of the Project Area, including the Lower Peninsula, West Valley, Guadalupe, Coyote, and Pajaro watersheds.

The SMP (both the existing SMP and the Proposed Project) does not include maintenance activities in or at reservoirs, dams, pipelines, groundwater percolation facilities, or water treatment plants. The SMP does include channel maintenance at dam outlet structures immediately downstream of reservoirs. The SMP also includes stream maintenance upstream of reservoirs, up to the 1,000 feet elevation contour. In addition, work activities performed to maintain creek and canal flow conveyance capacity cannot be used to increase the designed flow conveyance capacity of the facility; furthermore, work activities cannot be performed if they are specifically excluded in the SMP.

Municipalities within the Project Area include the cities of Campbell, Cupertino, Gilroy, Los Altos, Milpitas, Morgan Hill, Monte Sereno, Mountain View, Palo Alto, San Jose, Santa Clara, Saratoga, and Sunnyvale, and the towns of Los Altos Hills and Los Gatos. SCVWD does not provide maintenance on private property where no easement exists, unless expressly authorized by the SCVWD Board of Directors.

Horizon WATER and ENVIRONMENT

Figure 2-1: Project Area

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2.1.5 Project Channel Types

SCVWD actively manages over 1,000 miles of channels and creeks. For purposes of this document, the channels within SCVWD's jurisdiction are classified as earthen, concrete, tunnel, siphon, pipeline, or waterbody. The majority of SMP channels are earthen, having earthen channel bed and banks. SCVWD-maintained earthen channels may be either engineered and natural stream channels.

Figure 2-7 (all remaining figures can be viewed at the end of this chapter; photo figures are available on the page following their introduction) illustrates a generalized cross section of a SCVWD-maintained channel. Note that Figure 2-7 represents the wider and more complex channels in the Project Area, similar to the photo of lower Coyote Creek seen in Figure 2-8. This figure illustrates many of the channel features (e.g. top-of-bank, toe-of-slope, etc.) that are referred to throughout this document. Figure 2-9 provides a generalized illustration of an even wider channel alignment where a secondary channel area provides additional conveyance. Note that the channel maintenance zone in Figure 2-9 is still defined by the top of the outer levees. Figure 2-10 is a photo of the lower Guadalupe River, where this type of wide channel alignment with a secondary channel occurs.

Not all SMP channels are as wide and complex as those shown in Figures 2-7 through 2-10. Many of SCVWD's flood protection channels are narrow, linear, and uniform. Figure 2-11(a) depicts a linear trapezoidal channel built in concrete. This type of channel is demonstrated by the photo of San Tomas Aquino Creek (Figure 2-12). Figure 2-11(b) shows a simple trapezoidal channel with earthen banks and bed. These channels are very common in the Project Area and typically have maintained, grass-lined banks. These channels generally do not provide complex or high quality instream features or habitats. The photograph of Sierra Creek (Figure 2-13) illustrates this common channel type.

Figure 2-8. Coyote Creek

These photos show the vegetated benches adjacent to the low-flow channel and instream bar features. The upper banks are grass covered without taller canopy riparian vegetation.

Figure 2-10. Guadalupe River

The photo shows wide overall channel alignment, with secondary back channel.

Figure 2-12. San Tomas Aquino Creek

The photo illustrates a concrete linear trapezoidal channel.

Figure 2-13. Sierra Creek

Sierra Creek is a uniform and linear trapezoidal flood protection channel, characterized by limited vegetation, grass lined streambanks, and narrow easement because of adjacent homes to left. Maintenance access road is seen to the right.

2.1.6 Overview of SMP Approach

Work Area Projections and Annual Work Plans

Based on the work performed during the SMP 2002–2009, SCVWD has developed projections for reasonably anticipated work expected to occur over the next 10-year period of its maintenance program (2012–2022). The estimated work projections identify the potential creek and maintenance activities by watershed. Although general maintenance needs have shown a relatively consistent pattern historically, projections of future stream maintenance activities are not meant to represent the exact extent or volume of work that may occur.

Actual stream maintenance activities vary from year-to-year, depending on weather and hydrologic conditions, frequency and extent of past maintenance activities, and budget/funding availability. Future maintenance needs may occur, consistent with overall SMP Update projections, but they may vary from the specific location originally projected. Some maintenance activities, such as bank stabilization, cannot be reasonably projected because they happen in response to hydrologic events and a variety of site-specific factors. Under the SMP Update, maintenance activities would be conducted throughout the program area, as long as they do not result in new or more significant environmental effects than those evaluated and disclosed in this document.

Work site projections for specific activities are described in greater detail below. Based on SCVWD's experience during the 2002–2009 period (see Tables 2-1, 2-2, and 2-3), it is likely that the actual maintenance conducted during 2012–2022 will be less than the projected values.

Although the SMP Update work projections provide an overview of expected maintenance needs over the period 2012–2022 (as described above), maintenance needs in any given year would reflect a variety of factors. Each year, SCVWD would develop an annual stream maintenance work plan. The work plan would identify the locations, lengths, and areas for the given year's proposed maintenance activities. This information would be provided to overseeing regulatory agencies in the annual Notice of Proposed Work (NPW) and provided at http://www.valleywater.org/Services/StreamMaintenanceProgram.aspx, SCVWD's Web site. The actual maintenance activities that were conducted in a given year would be summarized and verified in the end of year annual Post Construction Report (PCR), and also would be made available to regulatory staff and the public.

Adaptability

The existing SMP was designed to be adaptable, to be updated and modified as conditions require. One way the SMP Update would achieve this would be by supporting site-specific assessments to determine the most effective method to achieve the maintenance goal. As conditions allow and technologies and environmental regulations evolve, this would support an assessment for work activity modifications that could result in decreased impacts. In addition, annual post-maintenance meetings, or "lessons learned" meetings, are planned so that SCVWD and resource agency staff can evaluate the effectiveness of both the resource protection and the maintenance methods used. These evaluations would be used to update Best Management Practices (BMPs) and SMP processes to create a greater understanding of how to accomplish environmentally-sensitive, fiscally-sound maintenance work.

2.1.7 Maintenance Guidelines

SCVWD undertakes three primary assessment programs to provide maintenance guidelines, standards, and baseline conditions to help prioritize and guide maintenance activities. These three programs include the District's Maintenance Guidelines standards, Watershed Asset Management Program, and Geomorphic Data Collection Program. These programs are briefly summarized below:

- **Maintenance Guidelines**: In the late 1980s and through the 1990s, the District developed the "Engineering-Based Maintenance Guidelines," or Maintenance Guidelines, to document the ongoing need for maintenance of flood protection channels to provide adequate flood conveyance capacity. The Maintenance Guidelines are organized into five volumes: Northwest Zone, North Central Zone, Central Zone, East Zone, and South Zone. A variety of information is provided for channels, including: channel location maps, summary data tables, background information, maintenance thresholds, maintenance history, and data and calculations used to develop the maintenance thresholds. Some creeks have the full set of information listed above; while some channels only have a subset of this

information. Most commonly, a maintenance history of past District actions is provided for included creeks. The District has not evaluated all the channels in the SMP program area and some channel evaluations are more complete than others. However, the District frequently relies on the information within the Maintenance Guidelines to identify maintenance needs.

- **Asset Management Program**: Begun in 2008, the District has undertaken an inventory of all assets within watersheds including creeks, levees, channels, mitigation sites, and other features. Through the inventory, District channels and other features are assessed for their condition and performance. This assessment provides a baseline to develop and optimize maintenance strategies and capital improvement programs. It is anticipated that integrating operations, maintenance, and capital investment decision-making processes will minimize the cost of owning these assets without jeopardizing financial health, the environment, the community, or service delivery and reliability. This program improves on existing practices by utilizing more advanced tools and protocols (making better use of information systems and technology), incorporating enhanced planning processes (using best practices and established models), and through increased consistency and standardization.

- **Geomorphology Data Collection Program**: In 2011, the District initiated this program to provide geomorphic support to the District's capital projects and maintenance activities, collect geomorphic data, and develop and maintain a geomorphic database. Through the Geomorphology Program, the District is building an understanding of creek geomorphology to improve the planning, design, and implementation of stream and channel maintenance and capital projects. The program's database directly assists the operations and maintenance activities in District watersheds and also provides information to support the evaluation of the Maintenance Guidelines described above. The Geomorphology Program includes collecting standard channel geometry, creek profile, and sediment conditions data. The program uses this information to evaluate bankfull flow elevations and discharge, and other conditions. Channel photos are included in the database. The Geomorphology Program assesses streams and channels to identify existing erosion conditions and practical solutions where appropriate, to improve stream stability within a dynamic equilibrium.

2.2 Maintenance Activities

The 2012 SMP Update would involve five categories of work activities: bank stabilization, sediment removal, vegetation management, management of animal conflicts, and minor maintenance. In addition, the SMP Update would include maintenance of canals, which may include any of the five activities described above. Full details regarding these maintenance activities are provided in Appendix A, and are summarized below.

2.2.1 Bank Stabilization

Stabilizing and repairing eroding stream channel banks and levees is a routine SMP activity. Based on the maintenance work conducted from 2002–2010, the District stabilizes about 0.94 mile of stream channel banks or levees on average per year. Although bank stabilization is routine and expected, the specific work locations are not certain until after each winter season. As a result, this type of maintenance (unlike sediment removal and vegetation management) is not a projected work activity. Rather, bank stabilization maintenance needs are assessed annually on an as-needed basis. Mitigation for bank stabilization projects is also determined on an annual basis depending on the identified work need.

For the SMP Update, the District has slightly revised and reorganized the list of suitable SMP bank stabilization treatments. These techniques are described in detail in the 2012 SMP Manual (Appendix A) and summarized in Table 2-4, which identifies the SMP's 13 bank stabilization treatments (and variations), shows mitigation ratios, describes whether the technique uses softscape or hardscape elements, and notes whether the technique requires review by regulatory agencies. SCVWD favors the use of soft bank stabilization approaches that use bio-technological approaches in place of methods that create more hardened banks.

Table 2-4. SMP Bank Stabilization Methods (SMP Update 2012)

ID No	Method	Mitigation Ratio	Hard/ Softscape	Requires Plan Review by Agencies
1	Earth Repair	1:1	Soft	No
1B	Earth Repair with Buried Rock	1:1	Soft	No
2	Live Construction	1:1	Soft	No
2A	Live Construction with Boulder Toe	1:1 if boulder toe is vegetated 1.5:1 if boulder toe is not vegetated	Vegetated: Hybrid Not Vegetated: Hard	No
2B	Live Construction with Log Toe	1:1	Soft	No
3	Contour Wattling	1:1	Soft	No
3A	Contour Wattling with Boulder Toe	1:1 if boulder toe is vegetated 1.5:1 if boulder toe is not vegetated	Soft	No
3B	Contour Wattling with Log Toe	1:1	Soft	No
4	Brush Mattress (Brush Layering)	1:1	Soft	No

Table 2-4. SMP Bank Stabilization Methods (SMP Update 2012)

ID No	Method	Mitigation Ratio	Hard/ Softscape	Requires Plan Review by Agencies
4A	Brush Mattress (Brush Layering) with Boulder Toe	1:1 if boulder toe is vegetated 1.5:1 if boulder toe is not vegetated	Vegetated: Hybrid Not Vegetated: Hard	No
4B	Brush Mattress (Brush Layering) with Log Toe	1:1	Soft	No
5	Surface Matting (Erosion Mats)	1:1	Soft	No
5A	Surface Matting (Erosion Mats) with Boulder Toe	1:1 if boulder toe is vegetated 1.5:1 if boulder toe is not vegetated	Vegetated: Hybrid Not Vegetated: Hard	No
5B	Surface Matting (Erosion Mats) with Log Toe	1:1	Soft	No
6	Add Rock to Invert	1:1	Hybrid	No
6A	Rock Cross Vanes	1:1	Hybrid	No
6B	Root Wads and Boulders	1:1	Hybrid	No
6C	Live Log Crib Walls	1:1	Soft	No
6D	Log Revetment	1:1	Hybrid	No
7	Cellular Confinement System	2:1	Hard	Yes
8	Rock Blanket	2:1	Hard	Yes
8A	Boulder Revetment	2:1	Hard	Yes
8B	Boulder Revetment with Soil and Vegetation	1:1	Hybrid	Yes
9	Articulated Concrete Blocks	3:1	Hard	Yes
9A	Articulated Concrete Blocks with Planted Areas	2:1	Hard	Yes
10	Concrete Crib Walls	3:1	Hard	Yes
11	Sacked Concrete	3:1	Hard	Yes
12	Gunite Slope Protection	3:1	Hard	Yes
13	Earth with Rock Toe on Grass Lined Channels[1]	2:1[2]~~None if rock is below bankfull depth, and includes some element of instream complexity. For areas above bankfull depth, use mitigation ratios as specified in ID Nos.1 thru 12 above.~~	Soft/Hybrid	No

1 Grass lined channels are those where grass is the predominant or sole vegetation, and that contain no significant riparian structure. The NPW submittal will include photographs and descriptions to justify use of this line item.

2 None if rock is below bankfull depth and includes some element of instream complexity.

Source: Data compiled by Horizon Water and Environment in 2011

Through the SMP, SCVWD may implement stream bank stabilization activities when the problem: causes or could cause significant damage to SCVWD property and/or adjacent property; or is a public safety concern. Additional benefits of stabilizing eroding stream banks include reducing instream sedimentation, and protecting water quality and other beneficial uses such as riparian habitat and recreation.

As described in the SMP Manual, sites with eroding or destabilized banks are evaluated for their local on-site soil conditions, slope stability, channel position, and geomorphic processes. An overall assessment is performed to determine the most appropriate treatment to stabilize the bank, with consideration of habitat, species use, and other site beneficial uses. Based on the condition assessment, the SCVWD design engineer will develop a treatment approach that stabilizes the streambank while trying to minimize the use of hardscape. Depending on work site conditions and hydraulic forces, the design engineer may favor the use of hardscape elements over softscape treatments if there is an increased risk for potential failure of the softscape treatments over the longer-term.

2.2.2 Sediment Removal

Sediment removal is the act of mechanically removing sediment deposited within a flood protection channel. Sediment removal is required when accumulated sediment reduces a channel's flow conveyance capacity, prevents facilities or appurtenant structures from functioning as intended, or impedes fish passage and access to fish ladders. Sediment is removed from SCVWD facilities to assist a channel to convey flow and minimize flood hazard, according to the existing channel design. Sediment removal under the SMP Update would not include increasing a channel's flow conveyance capacity beyond the as-built design. Sediment removal activities may occur along creeks, canals or at stream gauges.

Sediment removed from SCVWD channels and facilities would be assessed according to the appropriate Sediment Characterization Plan established by the RWQCBs. These characterization plans would be used to determine the physical and chemical properties of the removed sediment using continuous core, discrete sampling, and residual sampling methods. Collected sediment that met wetland reuse criteria area could be transferred to the south Bay Pond A8 to support tidal habitat restoration efforts at the pond. Sediment that did not meet these standards but met standards for landfill disposal would be disposed at a local landfill. Sediment that exceeded hazardous waste criteria would be disposed at an appropriate hazardous waste facility (e.g., Kettleman Hills hazardous waste landfill). Pond A8 is anticipated to have sufficient capacity for sediment disposal for the next 2-5 years. Additional ponds, including ponds A5, A1, A2W, and A9 have been identified as potentially suitable long-term sediment reuse locations. SCVWD also may add other upland or aquatic sites to its disposal options. Potential upland sites include the abandoned quarry pond next to the Coyote Parkway site, as well as the U.S. Fish and Wildlife Service refuge at Bair Island and Phase 2 of the South Bay Salt Pond restoration effort.

Sediment removal is a projected work activity. However, as discussed above, decadal projections may not reflect the actual maintenance work conducted. Annual sediment removal needs would vary, depending on yearly climate and hydrologic conditions. Since 2002, annual sediment removal volumes have ranged from a minimum of 8,845 cubic yards (cy) in 2008 to a maximum of 96,240 cy in 2006 (see Table 2-5).

Table 2-5. Actual Sediment Removal Work, 2002–2009

Year	New Work Length (feet)	Repeated Work Length (feet)	Sediment Removed (cy)	Annual Precipitation (in)
Santa Clara Basin				
2002	36,664	0	51,368	12.98
2003	32,946	4,608	85,504	13.62
2004	29,205	30,559	35,899	15.10
2005	9,170	45,315	39,420	22.80
2006	10,199	22,238	95,379	20.42
2007	17,989	13,027	33,523	8.38
2008	7,229	5,245	8,205	10.71
2009	5,512	5,294	14,720	13.83
Total	**148,914 feet (28.20 miles)**	**126,286 feet (23.92miles)**	**364,018 cubic yards**	
Pajaro Basin				
2002	2,532	0	751	17.36
2003	0	0	0	15.93
2004	2,853	0	1,765	19.66
2005	13,161	0	2,664	24.95
2006	1,760	0	861	18.45
2007	0	0	0	5.84
2008	600	0	640	14.62
2009	903	0	594	20.31
Total	**21,809 feet (4.13 miles)**	**–**	**7,274 cubic yards**	

Source: Data compiled by Horizon Water and Environment in 2011

As summarized in Table 2-6, over the next 10 years, estimated sediment removal activities may include 43 miles of creeks and canals in the Project Area, with approximately 35.4 miles in the Santa Clara Basin and 7.4 miles in the Pajaro River Basin. Table 2-6 also identifies how much of the work estimated for 2012–2022 would be located in "new" channel areas (i.e., areas where work was not previously projected for the 2002–2012 period in the existing SMP). For 2012–2022, about 19 miles of new channel areas are projected to have sediment removal work not included in the original program. For example, the Guadalupe Watershed will contain over 8 miles of these new work areas. However, as shown in the fourth column of Table 2-6, about 15 miles of channel area that

were included in the existing SMP projection for the 2002–2012 work period are no longer included in the current projections for the coming decade of work. For example, the West Valley Watershed would decrease in sediment removal activities by over 8 miles. Thus, as a program, the SMP Update would gain about 4 miles of net additional projected sediment removal activities.

Figures 2-14 through 2-18 (provided at the end of this chapter) are maps that show past and future projected sediment removal activities for the primary watersheds of the Project Area. More specifically, in Figures 2-14 through 2-18, sediment removal work that was projected for the first decade of the SMP (2002–2012) is shown in red. The areas shown in goldenrod are reaches where maintenance work was projected for the original decade 2002–2012 that also has been projected for the next decade. Finally, the areas shown in blue are reaches where new work areas have been projected for the 2012–2022 maintenance period.

Table 2-6. Projected Sediment Removal Work, 2012–2022

Watershed	2012–2022 Total Projected Sediment Removal (miles)*	New Work Areas for 2012–2022 (miles)	Work Areas from 2002–2012 Not Projected for 2012–2022 (miles)
Santa Clara Basin			
Lower Peninsula	3.9	0.7	2.6
West Valley	3.8	0.9	8.3
Guadalupe	11	8.7	0
Coyote	16.7	5.9	0.7
Pajaro Basin			
Pajaro	7.4	3.1	3.5
Total	**42.8 miles**	**19.3 miles**	**15.1 miles**

Source: Data compiled by Horizon Water and Environment in 2011

2.2.3 Vegetation Management

Similar to sediment removal activities, vegetation management activities are intended to maintain the hydraulic conveyance and flood safety functions of SCVWD's channels. Vegetation maintenance would seek to trim, thin, or remove vegetation that was causing flow blockages or significantly increasing hydraulic roughness and thereby reducing channel conveyance capacity. Vegetation management methods would include pruning, hand or mechanical removal, herbicide application, mowing, discing, flaming, and grazing. These methods are described in detail in the SMP Manual. Vegetation management activities may occur along creeks, canals or at stream gauges. Protective measures associated with these approaches are described in the BMP Listings (Table 2-12), provided at end of this chapter.

Certain types of vegetation management work (hand removal, herbicide, pruning, mowing, and discing) are projected activities as shown in Table 2-7. As defined in the projections, vegetation management may occur from the creek center to the outer edge of SCVWD property line/SCVWD management area. Other types of vegetation management (e.g., flaming and grazing) would be performed on an as-needed basis along any creek within the Project Area where SCVWD has fee title or easement. Tree removals may occur on a site-specific basis, per the criteria and mitigation described in the SMP Manual.

Table 2-7. Projected Vegetation Management Work Type by Watershed

Watershed	Hand Removal (miles)	Herbicide (miles)	Pruning (miles)	Mowing (miles)	Discing (miles)
Santa Clara Basin					
Lower Peninsula	2.5	47.8	22.7	3.8	0
West Valley	3.2	146	61.7	32.6	0
Guadalupe	6.9	277.7	211.6	146.8	.4
Coyote	88.6	213.4	159.5	58.3	.5
Pajaro Basin					
Pajaro	49.7	162	156.6	45.9	.9
Total	**150.9 miles**	**846.9 miles**	**612.1miles**	**287.4miles**	**1.8 miles**

Note:
Values do not account for overlapping work areas.
Source: Data compiled by Horizon Water and Environment in 2011

SCVWD's preference is to first thin or prune trees before considering tree removal. However, when tree removal is necessary, SCVWD prioritizes retaining native trees in place of non-native species. In general, the program includes the removal of trees and shrubs less than or equal to 12 inches diameter at breast height (dbh). Chapter 2 of the SMP Manual describes the District's vegetation management and tree removal activities in detail.

Several maps, provided at the end of this chapter, describe the location of vegetation maintenance activities within the primary watersheds of the SMP. Hand removal, pruning, and mowing vegetation management activities that occur below the bankfull elevation ("instream activities") are shown in Figures 2-19 through 2-23. Similar to the sediment removal maps, the three colors on the map indicate locations for:

- projected activities for the first decade of the SMP, 2002–2012 (shown in red);
- projected activities for both the first decade (2002–2012) and second decade (2012–2022) of the stream maintenance program (shown in goldenrod); and
- projected activities for only the SMP Update, 2012–2022 (shown in blue as new maintenance areas).

Figures 2-24 through 2-28 show the location of hand removal, pruning, mowing, and discing vegetation activities that occur above the bankfull elevation in the channel ("non-instream") and are differentiated according to the first or second decade of the SMP, using the same three-color system as in the other maps.

Figures 2-29 through 2-33 include maps that show where instream (below bankfull elevations) herbicide application is projected to be applied. Figures 2-34 through 2-38 show where non-instream herbicide application (above bankfull elevation) is projected for the SMP Update. Because most of the Project Area channels have maintenance road access from either side of the channel (see Figures 2-8 and 2-13), vegetation maintenance requiring large mechanized equipment typically would occur from the top-of-bank access road and the upper bank/bench zone. Large mechanized equipment would not be used to cross an active/wet stream channel. Vegetation management occurring in mid-channel areas that are separated by active wet creeks would only be conducted with hand-held tools (including mechanized hand-held tools), to prevent the need of crossing an active wet stream course with large mechanized equipment; although small trucks may need to cross wetted areas for creek access.

2.2.4 Management of Animal Conflicts

In the Project Area, animals can damage SCVWD channels, facilities, and infrastructure. The stability of banks and levees may be reduced as a result of animal burrowing, foraging on mitigation sites, and interfering with work activities. Management of animal conflicts refers to the use of avoidance tactics, biological control, site alterations, habitat alteration, and lethal control to reduce conflicts between SCVWD facilities and local species. These control methods are described in the Management of Animal Conflicts chapter of the SMP Manual (see Appendix A). Animal conflict management can occur year-round, though the selected control methods are dependent on the site conditions, animal specific life cycles, and applicable regulatory permits.

Although routine, the extent and specific locations for animal conflict management are generally not known in advance of the conflict itself. As such, animal conflict management activities are not projected, with the exception of rodent control activities on designated levee reaches. Rodent control activities are estimated to occur on approximately 115 miles of creeks and canals in the Santa Clara Basin and approximately 15 miles in the Pajaro Basin annually (whereby each bank is counted separately).

2.2.5 Minor Maintenance

Minor maintenance activities would be performed to repair and maintain SCVWD facility functions. Minor maintenance activities may occur along creeks, canals or at existing stream gauges. Minor activities are small in size and have limited potential to impact environmental resources. A minor activity is defined as an activity that results in removing less than 0.05 acres (2,178 square feet) of wetland or riparian vegetation. The minimum size for any minor vegetation work to be notified in SCVWD's NPW is 0.01 acres (436 square feet) per project, which includes any vegetation work necessary for access or staging.

Minor maintenance activities proposed under the SMP Update would include:

- cleaning and minor sediment removal at outfalls, culverts, flap gates, tide gates, inlets, grade control structures, fish ladders, and fish screens (limited to 50 cy);
- minor in-channel (or canal) sediment removal (less than 10 cy);
- trash and debris removal;
- repair and installation of fences and gates;
- grading and other repairs to restore the original contour of existing maintenance roads;
- grading small areas without vegetation above stream banks to improve drainage and reduce erosion;
- repair of structures with substantially similar materials within approximately the same footprint (i.e., replacement of concrete linings, culverts, pipes, valves);
- graffiti removal;
- installation and on-going maintenance of mitigation and landscape sites (including irrigation, weed control, and replanting of dead or declining individual plants until success criteria were met);
- removal of obstructions at structures to maintain function (i.e., bridges, stream flow measuring stations, box culverts, storm drain outfalls and drop structures); and
- stream gauge maintenance including stilling well cleaning, painting of gauge house, replacing/adding antenna or solar panels to existing structures, replacing instrumentation, cableway repair, weir cleaning of algae and debris, and unburying staff markers/orifice/communication pipes.

Minor maintenance activities are not projected and may occur anywhere within the Project Area. The minimum reporting size for any minor vegetation work is 0.01 acres per project. Yearly minor maintenance activities would be limited to less than 0.2 acres of wetland or riparian vegetation impact per year. Similarly, cumulative minor maintenance activities would be limited to 2 acres total wetland or riparian vegetation impact over the 10-year planning period.

2.2.6 Canal Maintenance

The SMP Update would include routine and periodic maintenance conducted by SCVWD on its canals. The location of SCVWD canals is shown in Figure 2-39, and representative photos are provided in Figure 2-40. Unlike the streams and flood protection channels that are the primary focus of the existing SMP, SCVWD's canals are primarily water supply transport facilities, but they do provide additional flood management functions locally.

Routine canal maintenance may include all of the general work activities discussed above, including: sediment removal, vegetation management, management of animal conflicts, bank stabilization, and minor maintenance.

Sediment removal in canals is typically small in scale and localized (generally 10 cy or less per occurrence), and is conducted to clear small sediment deposits ("plugs") where local

sediments have either entered the canal or have been deposited. Canal sediment removal activities are generally performed using a small loader from the top of the adjacent canal access road. Canal sediment removal may also be conducted using hand tools because of its small volume.

Figure 2-40. The Almaden-Calero Canal

Sediment removal may occur anywhere along the canals; however, no more than 1,000 cy of sediment would be removed per calendar year from all SCVWD canals.

Vegetation management along the canals would include some periodic herbicide use, inside the canals and along the access roads to address weed growth. In the upland margins adjacent to the canals, SCVWD would conduct periodic and routine tree hand pruning, hand removal, and grass mowing, using the same techniques described above in the *Vegetation Management* section. In general, vegetation management may occur anywhere along or within the canals; however, no more than 6 acres of work would be performed in a given calendar year. In addition, discing would be restricted to the right bank of Coyote Alamitos canal only.

Additional minor maintenance activities performed along the canals would include minor grading of the access road, graffiti removal, fence repair, erosion repairs, management of animal conflicts, and bank stabilization activities. Minor structural repairs may include repairing a concrete lining, culvert, pipe, valve, weir, instream orifice, or communication pipe. These canal maintenance activities, because of their small-scale and uncertain location, are not projected activities and may occur anywhere along the canals as needed.

2.2.7 Activities Not ~~Included~~ in the SMP Update

The SMP Update would not include the following activities, which are therefore not analyzed in this document:

- work that would increase the designed flood conveyance or water supply capacity of a facility;
- maintenance work in stream reaches that are above the 1,000-foot elevation contour
- removal of hazard trees;
- maintenance work of dams, reservoirs and other water supply facilities, such as pipelines outside of stream corridors, groundwater percolation ponds, and instream summer dams;
- installation of new or major modification of fish ladders;
- work conducted on private property by others;
- work performed by other agencies;
- other large construction projects or capital improvement projects;
- area-wide, intensive maintenance, or rehabilitation of large (greater than 0.05 acre) mitigation projects installed as part of SCVWD Capital Improvement Projects (CIPs)
- emergency repair work; and
- continued implementation of mitigation measures in the existing SMP.

A situation is considered an emergency if it is a sudden, unexpected occurrence involving a clear and imminent danger that demands immediate action to prevent or mitigate loss of or damage to life, health, property, or essential public services (Public Resource Code Section 21060.3). Although emergency situations will not be covered in the SMP, SCVWD would make every effort to follow the guidance provided in the SMP Manual (Appendix A) when implementing activities under emergency conditions.

Large construction projects and CIPs are not considered routine stream maintenance and are not addressed through the SMP. Future CIPs will analyze and account for long-term maintenance impacts under the CIP's environmental review.

2.3 Stream Maintenance Process Overview

2.3.1 Annual Work Sequence

Annual administration of the SMP Update would occur in three phases (as shown in Figure 2-41). In the winter and early spring, maintenance needs would be assessed and prioritized, the annual maintenance work plan would be developed, and the regulatory agencies would be notified through the ~~Notification~~Notice of Proposed Work (NPW) document. During the summer and early fall, maintenance projects would be more specifically planned and

implemented. Toward the end of the year and into the following early winter, the annual Post-Construction Report (PCR) would be developed, distributed, and SCVWD staff and managers would meet with regulatory partners to review the past year's work. These work phases are described in more detail below.

Phase 1: Annual Maintenance Activity Identification, Development and Documentation

The first phase of the annual work sequence would begin with identifying maintenance needs. Maintenance work could be proposed either as part of the annual work plan through the NPW submittal, subsequent regulatory notifications/submittals, or as identified throughout the year via individual work orders. SCVWD internal work orders would provide a description of the project, schedule of implementation, estimated costs, permit requirements, and other special conditions.

For minor maintenance projects, the appropriate resource protection measures and BMPs would be identified and work would proceed. For other maintenance activities, a more detailed review process would occur and may include site assessment and/or engineering evaluations. These activities would be reviewed to verify they were covered under the long-term regulatory clearances provided in conjunction with the SMP Update. If the work was not covered by the SMP Update, the appropriate project development process would be followed, and may include individual CEQA review and project-specific regulatory permits or clearances. For covered activities, appropriate resource protection measures and BMPs would be identified and added to the work order. For maintenance activities requiring compensatory mitigation, mitigation would be planned and notified according to Appendix C (2012–2022 SMP Update Mitigation Approach Memorandum) and summarized in Section 2.4.3 below. Pre-work meetings would be held with appropriate SCVWD staff to discuss site-specific requirements, environmental constraints, and BMPs.

Phase 2: Implementation of Annual Routine Stream Maintenance Work

Maintenance activities would be implemented during the relevant work season (as described below) or as described in the work order. Specific maintenance steps and methods are described in more detail below. In addition, direct field monitoring of maintenance work would occur for both sediment removal and bank repair activities. This would be done so that work would be conducted as described in the annual NPW. Field monitoring would include inspections of BMPs so that they would be effective in preventing adverse impacts to water quality and stream habitats.

Maintenance Timing

Work windows for sediment removal, instream vegetation and herbicide application, and bank stabilization generally would be conducted between June 15 and October 15. However, if the fall season remained dry, work could continue until the first significant rainfall event occurred. A significant rainfall event is defined as local rainfall of 0.5 inches or greater within the watershed over a 24-hour period. The following precipitation gages are used to determine maintenance work allowance. Each SMP watershed has a target rain gage to assess rainfall conditions and to determine if a significant rain event has occurred.

- Lower Peninsula Watershed (station located in the City of Mountain View Corporation Yard)
- West Valley Watershed (station located at Santa Clara County West Yard Maintenance facility)
- Guadalupe Watershed (station located near the City of San Jose, Office of Emergency Services)
- Coyote Watershed (Penitencia Water Treatment Plant, station located at Anderson Dam.)
- Pajaro Watershed (Church Ave percolation ponds, station located in Morgan Hill)

Even if no significant rainfall occurred, no instream work (excluding hand pruning and hand removal in non-steelhead streams) would continue later than December 31.

SCVWD also relies on weather forecasts to prepare for situations when significant rains are anticipated. After October 15, 72-hour look-ahead weather forecasts from the National Weather Service (or local vendor such as the Western Weather Group) would be consulted. If a significant rainfall was forecast within the 72-hour forecast window, maintenance work that may result in sediment runoff to the stream would be stopped, to allow adequate time to complete erosion control measures.

In general, permits issued by regulatory agencies for the SMP and/or mitigation requirements stemming from the CEQA analysis may place additional limitations on work types and windows; these would be verified and incorporated into the Proposed Project implementation as applicable.

Other activity-specific requirements related to work windows would include:

- Bank Stabilization:
  - Projects ~~that were more than 50 percent complete on October 15~~ may continue until the approved date stated below~~completion~~ or until the first 3-day forecast that include~~d~~s significant rainfall.
  - In Creeks Supporting Anadromous Fish
    - An extended work window may occur until October 31st for bank stabilization projects that will be 50% complete by October 15th.
  - In Creeks Not Supporting Anadromous Fish
    - An extended work window may occur until November 30th for projects that will be 50% complete by October 15th or until significant rainfall.
    - An extended work window may occur until November 30th for new bank stabilization projects that will be completed in five (5) days or less, or until significant rainfall.

- After October 15, all incomplete bank repair projects would be winterized[1] before the date when the forecast included significant rainfall.

- Sediment Removal:

  - Work may occur until December 31.
  - Additional sediment removal work may occur ~~after the first significant rainfall event only~~ within Berryessa Creek (0-88+80; 232+70-236+00; 284+30-288+00), Lower Silver Creek (Reach 3 between Stations 37+40 and 381+19), Thompson Creek (0+00-10+00), Canoas Creek (0+00-390+00), Ross Creek (0+00-86+30), Calabazas Creek (35+00-105+00), and San Tomas Aquino Creek (80+00-100+00), if clearance was provided through a preconstruction biological survey; site conditions were dry; vehicles would not impact roadways; no water diversions were used; and work would stop in the event of any rainfall forecast 3 days in the future~~; and e-mail notification of work would be provided to regulatory agencies 2 days before start of work~~.
  - Sites would be maintained in a winterized state during extended work windows.
  - Work may occur after a significant rainfall event but no later than December 31.

- Vegetation Management:

  - As a non-ground disturbing activity, instream hand pruning may occur year-round except where equipment would need to access the site by crossing a creek or otherwise affect water quality, or in steelhead creeks ~~where the general work window would apply~~ to Dec 31 or significant rainfall. As described above, mechanized equipment would not cross an active (wet) creek.
  - Upland vegetation activities and all other non-projected non-instream maintenance work may occur year-round, weather permitting. Upland vegetation activities would include work occurring above the bankfull hinge point (see Figure 2-7) to the outer edge of SCVWD management area.

Bank Stabilization

As summarized in Table 2-4, the SMP Update would include several bank stabilization approaches, ranging from "soft structures" (e.g., willow brush mattresses, log crib walls, and pole plantings), to "hard structures" (e.g., concrete, and sacked concrete~~, and gabions~~), or a combination of hard and soft structures. Bank stabilization measures that create extensive inflexible, impervious channel banks with essentially no revegetation ability or habitat opportunities are termed "hard" and the product is called "hardscape." Measures that retain

[1] Winterization is the process to prepare and maintain work sites with the appropriate BMPs to prevent erosion, sediment transport, and protect water quality during the rainy season. Winterization occurs on completion of bank repairs or on incomplete projects after October 15 and before the forecast of significant rainfall, 0.5 inches or greater of local watershed rainfall within 24 hours. Winterization would be completed before the occurrence of such actual significant rainfall.

natural earthen banks and have higher capacity to support vegetation or habitat are termed "soft" and the product is called "softscape."

Hybrid bank stabilization refers to a combination approach whereby softscape bank stabilization approaches like live construction, contour wattling, brush mattresses, or surface erosion matting are combined with a limited amount of rock toe protection at the base of the bank stabilization site. Additional boulders at the toe of the bank treatment is only applied if necessary, if there are hydraulic shear forces affecting the bank site, or geologic slumping or mass wasting forces affecting the site (because of the site's position or slope) that require the additional presence of mass/rock at the base of the slope.

SCVWD has committed that no more than half of non-in-kind bank repairs would consist of impervious hardscape each year. Bank stabilization also would include preventative maintenance to reduce the chances of banks eroding in the future. Refer to the Bank Stabilization Methods table in the Bank Stabilization chapter of the SMP Manual for further descriptions of each method (see Appendix A). Equipment used for bank stabilization activities may include excavators, bulldozers, and front-end loaders for bank grading and earth-moving activities. Staging typically would occur on adjacent access roads. Soil and other repair materials typically would be staged in areas that were previously disturbed (i.e., service roads, turn-outs, etc). In some cases, bank stabilization projects may require the installation of temporary roads and ramps to access the work site. Where tree pruning would not provide adequate clearance for maintenance vehicles and heavy equipment, SCVWD would make an effort to select an access route that would avoid mature, native trees. Where trees may have to be removed, SCVWD would target non-native trees for removal. Removal of large branches from mature trees for equipment access would be evaluated carefully and avoided whenever possible. The average duration of bank stabilization work is 10 working days per site.

Sediment Removal

Sediment may be removed by excavators, grade-alls, draglines, and/or loaders. Temporary dams, pipes, and existing overflow channels would be used if water needed to be bypassed around the site during work. Sediment removed from the channel typically would be placed in 10- or 20-cy dump trucks, and prepared for off-site hauling and disposal. Stockpiling of sediment to allow for drying before disposal only would be done when sufficient space would allow the temporary piling of material; however, this would not be typical. The average duration of a sediment removal project would be 10 days, although it could last up to several weeks, depending on the size of the project. Further details regarding the specific methods used for sediment removal are provided in Appendix A.

Vegetation Management

Vegetation management techniques would include hand removal, using small tools and hand-held equipment (chainsaws, weed-eaters, flamers), mechanical removal using heavy equipment, herbicide application, and grazing. Heavy equipment used for vegetation removal may include a disc attachment on a tiller to clear aboveground herbaceous plants on the upland parcels outside of stream banks; flail mowers to cut weeds and other

vegetation on the inside slope of some levees or stream banks; or a backhoe or rubber-tracked excavator, used for removing material from the channel.

New techniques described in the 2012 SMP Manual (Appendix A) would include grazing and the use of flamers to manage vegetation. In limited circumstances, SCVWD may use various domestic animals to provide non-specific weed control. Such animals may include sheep, goats, or other appropriate species. Larger scale grazing by cattle is normally not appropriate for SCVWD facilities. Flaming would involve the use of a hand-held, propane gas powered flamer to control weed seedlings.

Herbicide application in upland areas typically would be sprayed from a truck-mounted rig or applied using a controlled drop applicator. Spray trucks would be used to apply herbicides to areas such as maintenance roads. Herbicides may be selectively sprayed instream following appropriate biological surveys and clearances. Only herbicides and surfactants approved for aquatic use by the USEPA and registered for use by the California Department of Pesticide Regulation would be used for SCVWD's aquatic vegetation control work.

The SMP Update includes an expanded list of herbicide types and a broader area of application. For example, application of herbicides in the Pajaro River watershed was not included in the existing 2002 SMP Manual and FEIR. This restriction was self-imposed and later was formalized in some of the regulatory permits issued for the SMP in 2002. Use of surfactants also was limited under the original program.

The Proposed Project would enable herbicide use within the Pajaro River watershed and incorporate surfactants under restricted conditions as an application aid. Additional application adjustments would include: a longer work window (see above); application in upland areas; and application in sensitive species habitat under certain restrictions. See Table 2-11 at the end of this chapter for a comparison between existing SMP (2002–2012) and the SMP Update (2012–2022) approaches.

Once vegetation management was complete, a portion of the woody green waste would be chipped for mulch and stored for later use at SCVWD property, while the remainder would be transferred to a composting landfill.

Management of Animal Conflicts

Management of animal conflicts generally would be conducted with the use of hand-placed materials using small tools and hand-held equipment. This would include establishing buffers and biological repellants, trapping, as well as lethal baiting and fumigant applications (see Appendix A for more details on methods). Heavy equipment may be used to modify habitat conditions and reduce or eliminate burrowing animals through surface compaction, filling of burrows with slurry, and tilling areas to destroy food sources. All lethal control methods would be designed to comply with the County Agriculture Commission requirements and would be implemented using BMPs that would be designed to avoid or minimize effects on special-status species.

Minor Maintenance and Canal Maintenance

In general, Minor Maintenance and Canal Maintenance would include activities already described under the previous four categories. Further information regarding their implementation can be found in Appendix A.

Phase 3: Annual Reporting

At the conclusion of each year's maintenance season, a Post-Construction Report (PCR) would be developed and submitted to the appropriate resource agencies. This report would include a summary of the year's maintenance projects, describing what activities occurred and where, a description and confirmation of the restoration and mitigation activities implemented, and other SMP updates as necessary.

Annual Program Review

Following the submittal of the PCR, resource agency staff would be invited to meet with SCVWD staff for an annual "lessons learned meeting," to be held in February or March of each year, to evaluate the effectiveness of both resource protection and maintenance methods used in the preceding construction season. The information discussed at these annual lessons learned meetings would be used to adaptively manage the BMPs and SMP processes to improve SMP effectiveness.

2.4 Programmatic Impact Avoidance, Minimization, and Compensatory Mitigation

A three-part sequence would occur~~s~~ so that Proposed Project impacts would be avoided, minimized, or addressed through compensatory mitigation. First, the SMP Update itself has several built-in or internal restrictions and protocols to avoid or minimize impacts by limiting how and where maintenance could occur. Second, the operational implementation of maintenance activities would be required to adhere to specific BMPs. Thirdly, residual impacts remaining after these two impact avoidance and minimization efforts would be addressed through compensatory mitigation. These three approaches to address potential Proposed Project impacts are further described next.

2.4.1 Programmatic Impact Avoidance and Minimization

The Proposed Project would incorporate the following overarching principles to protect natural resources and guide decision-making for stream maintenance activities and projects. Proposed Project BMPs (discussed further below) were developed to be consistent with these principles.

Principle 1: SCVWD will implement all routine stream maintenance activities according to the process and protocols established in the SMP Update.

Principle 2: Decisions regarding the necessity of routine sediment removal and vegetation management activities (to restore channel flow capacities)

will be made following the thresholds and standards provided in the District's Maintenance Guidelines and Asset Management Program.

Principle 3: SCVWD will implement measures to avoid and minimize impacts to native species and habitat.

Principle 4: All maintenance activities will be performed in a manner that has the least impact to the natural flora, fauna, and aquatic resources while meeting SMP Update objectives.

Supporting these SMP principles, the following measures and protocols would be applied by SCVWD so that the work would be effective and also would avoid or minimize potential environmental impacts:

- No work above 1,000-foot contour level. This elevational boundary would limit the extent of the SMP and prevent maintenance work in the higher watershed lands.

- Identifying the Minimum Maintenance Need: SCVWD would identify and evaluate maintenance needs using the standards and thresholds in the Maintenance Guidelines and Asset Management Program. These guidelines are based on the engineered design of the channel and outline the level of maintenance required to maintain adequate flood protection capacity in the streams and canals within SCVWD's jurisdiction. This measure would minimize unnecessary intervention in stream processes and restrict maintenance to only necessary and appropriate activities.

- Consideration of Existing Channel Features in Analysis and Design: SCVWD would attempt to retain the functions of instream habitat features such as low-flow channels and pools after sediment removal in areas used for migration by salmonids. In such areas, the geomorphic functions of existing channel features would be incorporated into the project design approach, as feasible, to restore instream habitat functions. Similarly, SCVWD would consider the hydraulic influences upstream and downstream of bank stabilization sites to address potential stream velocity and erosion effects. Bank stabilization projects would be designed to minimize impacts to the stream channel.

2.4.2 Best Management Practices

The maintenance activities would incorporate a range of measures to minimize undesired effects on the environment and to implement the SMP principles described above. BMPs specifically created for the SMP Update encompass the range of proposed maintenance activities and the environmental conditions of the Project Area. The BMPs for the SMP Update are listed in Table 2-12 at the end of this chapter. These BMPs include general BMPs that would apply to all work, as well as activity-specific BMPs designed to address anticipated effects of certain work activities or particular types of resources.

2.4.3 Compensatory Mitigation[1]

SMP Mitigation Program under the Existing 2002 SMP

SMP mitigation measures were developed in 2002 to compensate for anticipated impacts caused by SMP activities. Mitigation for sediment removal and vegetation management was based on a comprehensive accounting in 2002 of the potential impacts from maintenance activities on instream wetlands, tidal wetlands, riparian vegetation, and other sensitive habitats in the program area. Table 2-8 summarizes the existing mitigation requirements for ongoing SMP activities. The SMP mitigation program includes land acquisition, habitat protection, and wetland restoration/creation~~, and invasive species control activities~~ to mitigate for maintenance activities.

An important aspect to the original mitigation approach was that the "programmatic" or "up front" mitigation was calculated based on the maximum work projections. The programmatic mitigation included coverage for repeat maintenance work at sites in perpetuity. Impacts from other non-projected maintenance activities such as bank stabilization projects are mitigated on an "as-needed" basis using defined mitigation ratios as maintenance projects occur.

As shown in Table 2-8, to date not all of the SMP's mitigation requirements have been met. The District is committed to completing all remaining mitigation requirements. Appendix A of the Mitigation Approach Memorandum (which is included in the DSEIR as Appendix C) includes a letter from the District to San Francisco Bay RWQCB that describes the current status of the SMP mitigation program and presents a plan to meet all of the District's SMP mitigation requirements identified in the 2002 SMP and the associated permits for the 2002-2012 program period. The District Board has recently approved the purchase of a property (known as the "Castle & Cooke property"). The District continues to pursue land acquisition opportunities for Stream and Watershed Protection.~~ In addition, a proposed project to restore wetlands at Laguna Seca is currently under technical review. If feasible, this project could provide some or all of the remaining needed wetland mitigation credit.~~

The mitigation requirements shown in Table 2-8 were established in 2002 based on the maximum SMP work projections at that time. The actual amount of sediment removal work conducted during the 2002–2012, as shown in Table 2-1, was 371,292 cy, which is about 47 percent of the total sediment removal volume of 795,600 cy projected in 2002. Or, in terms of length, 32.3 miles of sediment removal have been conducted to date, about 56 percent of the 2002 projected length of 58 miles. Completed vegetation management activities since 2002 have been more consistent with the original work projections.

[1] While the mitigation program is not technically part of the Proposed Project, it is summarized in this chapter for clarity and because the impacts of the mitigation program were considered in the environmental analysis in this DSEIR. A more complete description of the mitigation program is presented in Appendix C, and mitigation measures for significant impacts have been included in the impact analysis. These mitigation measures would direct the District to implement the mitigation program, and each mitigation measure describes the manner in which it would be implemented to addresses a significant impact.

As shown in Table 2-8, 30 acres of required tidal wetland mitigation for the program have been completed. This is approximately 21 acres greater than the mitigation that would have been required based on the area of tidal wetland impacted to date. The District is proposing to use the 21+ acres already provided as mitigation as credit toward future tidal habitat impacts that are not yet identified or accounted for. The smooth cordgrass control mitigation component compensates for the time-lag between immediate impacts to tidal wetlands from SMP activities and the delay in the creation of a functional tidal wetland mitigation project. The smooth cordgrass control mitigation requirement is complete. Freshwater wetland mitigation in the Santa Clara Basin is not yet complete, but in the Pajaro Basin, freshwater wetland impacts have been mitigated fully. As described above, SCVWD is committed to completing the mitigation requirements assigned for the 2002 program work projections, for which the 2002 projected areas will have mitigated for work activity impacts in perpetuity.

Table 2-8. 2002 SMP Mitigation Program

Mitigation Type	Mitigation Purpose	Mitigation Requirement	Mitigation Completed to Date	Percent of Requirement Completed*
Tidal Wetland Restoration	Restore Bay salt ponds to tidal marsh conditions, provides mitigation for tidal wetland impacts	30 acres	30 acres	100%
Freshwater Wetland Creation/Restoration	Convert or restore areas to seasonal or perennial wetlands, provides mitigation for non-tidal wetland impacts	10-acre Santa Clara Basin 4-acre Pajaro Basin	7-acre Santa Clara Basin 4-acre Pajaro Basin	70% Santa Clara Basin 100% Pajaro Basin
Stream and Watershed Protection	Preserve, protect, and improve streams and associated watersheds, provides mitigation for non-tidal wetland and CRLF impacts	Freshwater wetland habitat: ✦ 820-1080 acres acquired (81-acre credit) for Santa Clara Basin ✦ 11-acre credit for Pajaro Basin ✦ CRLF Habitat—108-acre credit District-wide	Freshwater wetland habitat: ✦ 10-acre credit (125 ac total) for Santa Clara Basin ✦ 11-acre credit (138 ac total) for Pajaro Basin ✦ CRLF Habitat – 56-acre credit Santa Clara Basin	✦ 12% Santa Clara Basin ✦ 100% Pajaro Basin ✦ 52% CRLF Habitat
Giant reed (*Arundo donax*) Control	Control giant reed outbreaks; map, revegetate, educate, and coordinate reed control efforts in the county	125 ac District-wide	116 acres District-wide	93%
Invasive Smooth Cordgrass Control (*Spartina alterniflora*)	Control Invasive Cordgrass along tidal shorelines, provides mitigation for time lag until tidal wetland mitigation is established	Up to 10 acres in tidal areas	10 acres	100%

* With the purchase of the Castle & Cooke property, some of the mitigation requirements not yet complete as shown above would be completed. Also, this status summary does not include achievement of final success criteria at completion of the monitoring period.

Source: Data compiled by Horizon Water and Environment in 2011

2012 Updates to the 2002 SMP Mitigation Program

The proposed SMP Update process includes reviewing and revising the existing compensatory mitigation package that was established in 2002. The 2002 SMP Mitigation Program that covers the original projected activities (sediment removal and vegetation management) would remain in place to provide compensatory mitigation in perpetuity for the channels identified in the 2002 work projections. The channel reaches shown in red in the maps at the end of this chapter (Figures 2-14 through 2-38) have all had their mitigation provided for through the original mitigation program. Because the original programmatic mitigation was developed to address compensatory mitigation for the 2002 SMP identified channels based on full work projections, the mitigation provided for these reaches (shown in red and gold colors in the maps) continues in perpetuity. No new significant environmental effects or a substantial increase in the severity of previously identified significant effects are anticipated under the SMP Update in these locations.

As described in Appendix C to the DSEIR (Mitigation Approach Memorandum), SCVWD would provide compensatory mitigation for SMP Update activities requiring mitigation by acquiring or protecting appropriate mitigation lands (including populations of special-status species, where impacts are to such species), using conservation easements or other vehicles as appropriate, or would provide suitable ecological services-based mitigation as needed to compensate for annual impacts. SCVWD would identify funding mechanisms to support the long-term maintenance and conservation of such mitigation lands and projects.

The compensatory mitigation program proposed for the SMP Update addresses potential impacts anticipated for new work sites that were not included in the original SMP work projections and not accounted for in the initial compensatory mitigation package. These sites are the blue channel reaches shown in the maps of Figures 2-14 through 2-38. Potential residual impacts from maintenance that would require mitigation in new work sites are similar in nature to the potential impacts that were identified in the 2002 SMP FEIR. Although the existing SMP mitigation would continue to serve as mitigation for the original work sites identified in the 2002 SMP, additional mitigation would be required for the new work sites.

The District identified the new work sites based on its understanding of maintenance needs for the 10-year period beginning in 2012. However, as observed from 2002 until the present, it is highly unlikely that all of the identified potential new sites will have actual work conducted. Because of the potential inaccuracy of using projected work estimates developed in 2010–2011 as a basis for defining mitigation requirements until 2022, the District has adjusted its approach in mitigation requirement identification. The District is now using the actual work sites (versus work site projections) as the final basis for mitigation requirements in new work sites. The SMP Update projects some "new" maintenance activities in previously mitigated areas. The impacts of this "new" work are considered to have been mitigated by the previous mitigation program because they are in the same work category (e.g., vegetation management).

The 2012–2022 maintenance work projections provided in the 2012 SMP Update DSEIR are useful estimates of where work would be conducted. The projections represent the

District's best estimate of where work would occur. The work projections are "conservative" because work likely would not occur in all of the newly identified reaches shown in the maps provided at the end of this chapter. The work projections are a useful basis to consider potential programmatic impacts to wetlands and other habitats and develop a suitable mitigation approach that can guide the next decade of the program.

Besides addressing mitigation for these new work sites, the compensatory mitigation program has been revised to improve overall mitigation feasibility and quality. A key constraint to the original SMP mitigation approach was its emphasis on land acquisition. As a result, feasible mitigation was often not available in a manner to support the program's needs. For the 2012 SMP Update, a broader suite of suitable mitigation approaches has been developed to provide increased flexibility while maintaining high mitigation quality.

As a result of this revised approach, ~~three~~two key changes are being made to the existing programmatic mitigation program (for sediment removal and vegetation management) for the 2012 SMP Update:

1. **Ecologic Services**. In addition to land acquisition-based mitigation projects that provide mitigation in perpetuity (i.e., mitigate for repeat impacts in the same work location), programmatic mitigation for sediment removal and vegetation management also would include ecologic services-based mitigation projects for individual maintenance projects. These approaches would provide mitigation on a "pay as you go" or incremental basis. Ecologic services-type mitigation projects would only mitigate for an individual work activity. Service-based "pay as you go" mitigation would be identified annually based on the annual maintenance work plan, provided in the annual NPW, and verified in the end of year annual PCR.

2. **Project Specific Accounting**. Rather than identifying all the necessary mitigation areas (acreages) for sediment removal and vegetation management activities "up front" in 2012 for the new work sites where maintenance would occur between 2012 and 2022, mitigation criteria and metrics would be identified by standard unit measures (typically acreages). The specific extent of mitigation required for any given year's work will be defined annually when the work areas are precisely identified. This annual mitigation analysis will clearly distinguish mitigation requirements for new work areas from mitigation already accomplished for work in areas projected in 2002.~~The actual mitigation requirement would be calculated annually when the work sites were more precisely defined.~~

~~3. **New Programmatic Mitigation**. In addition to the mitigation approaches described above, the District would provide additional programmatic habitat mitigation through the instream complexity and gravel augmentation mitigation programs.~~

These two~~three~~ adjustments to the programmatic mitigation program are further described in Appendix C (2012–2022 SMP Update Mitigation Approach Memorandum). The District would be able to use "pay as you go" mitigation projects/services to provide incremental mitigation annually on an as-needed basis. The District also could continue to purchase lands to provide longer-term mitigation needs. In this way, the District would have more

flexibility to pursue suitable mitigation opportunities through either long-term land acquisition or annual mitigation project approaches. Mitigation credits from the 2002 SMP mitigation program (Stream and Watershed Protection) may potentially be applied to new work areas in need of mitigation support. The District would work with the appropriate regulatory staff to identify, review, and approve the potential application of existing mitigation credit toward new work areas.

As described above, the location and extent of bank stabilization activities are difficult to predict and have never been projected work activities. Since 2002, bank stabilization projects that required mitigation have been mitigated using an annual assessment and "pay as you go" incremental mitigation process. For bank stabilization projects, identifying impacts and necessary mitigation would continue to occur annually, depending on what bank work was needed. Bank stabilization treatments and their associated mitigation ratio requirements are listed in Table 2-4, and may include programmatic mitigation components (instream complexity) as well.

Table 2-9 summarizes the key attributes of the updated mitigation approach for sediment removal and vegetation management activities. Details for these programs are provided in Appendix C (2012–2022 SMP Update Mitigation Approach Memorandum).

Table 2-9. 2012–2022 Mitigation Approach for Sediment Removal and Vegetation Management Activities

Mitigation Component	Ratio/ Metric	Notes
Land acquisition (in-kind preservation/enhancement)	3:1	Mitigation applied in perpetuity
Land acquisition (in-kind restoration)	1.5:1	Mitigation applied in perpetuity
Land acquisition (watershed lands out of kind)	8:1	Mitigation applied in perpetuity
Invasive plant management program	1.2:1	Mitigation assessed and applied annually
Riparian restoration and planting program	1.2:1	Mitigation assessed and applied annually
Tree plantings for removal of trees less than or equal to 12 inches dbh	1:1 2:1 3:1	Mitigation ratio determined by tree scoring protocol provided in the 2012–2022 SMP Update Mitigation Approach Memorandum (Appendix C of this document), in its Appendix B.
Instream habitat complexity features	~~0.5~~1:1	Mitigation can be applied either through a number of projects or according to project area, using the ~~0.5~~1:1 ratio
Gravel augmentation in steelhead creeks	1:1	Mitigation option for impacts in steelhead creeks due to sediment removal activities

Source: Data compiled by Horizon Water and Environment in 2011

In addition to the programmatic mitigation described in Table 2-9 for sediment removal and vegetation management, mitigation would be provided to compensate for impacts to individual special-status species resulting from SMP Update activities. The species for which compensatory mitigation would be provided, and the form that this mitigation would take, is identified in Section 3.3, *Biological Resources* and will be further described in pending Biological Opinions (BOs) for the 2012 SMP Update to be issued by the National Marine Fisheries Service (NMFS) and the U.S. Fish and Wildlife Service (USFWS), as well as the Incidental Take Permit that will be issued by the California Department of Fish and Game (DFG). The impact analysis in this document is intended to provide CEQA coverage for all mitigation activities under the Proposed Project, to the extent that the mitigation projects would not result in any new or more significant impacts than those disclosed in this DSEIR.

The mitigation approach presented in this DSEIR has been developed to meet the requirements of CEQA. However, it is anticipated that the mitigation approach will be further refined as part of the programmatic permit renewal process. Therefore, in no case would the mitigation program be changed so that it would be less protective of the impacted resources in question, compared to the approach presented in this DSEIR. Once mitigation requirements have been finalized, SCVWD staff would track and report annual and cumulative work quantities to verify compliance with the one-time accounting mitigation package.

2.5 Permits and Approvals

Several state and federal agencies granted permits and approvals to SCVWD to implement the 2002–2012 SMP. These same agencies are working together as the Inter-Agency Work Group (IAWG) in an effort to refine the SMP Update and required mitigation, and issue new multi-year permits and approvals to authorize SCVWD to continue implementing the SMP between 2012 and 2022. As CEQA responsible agencies, state permitting agencies will utilize this SEIR (once it is certified) as their CEQA compliance document in issuing permits. If applicable, the U.S. Army Corps of Engineers (USACE) will use this SEIR as background information for Section 404 permit NEPA compliance, and the USFWS and NMFS will use this SEIR as background information for Section 7 consultation with the USACE. A summary of agencies, applicable laws/regulations, and existing permits proposed for renewal is provided in Table 2-10

Table 2-10. Agency Approvals

Agency	Applicable Law/Regulations Guiding Jurisdiction	Current or Prior Permits or Approvals for Maintenance		
		Description	Original Date of Issuance	Date of Expiration
California Department of Fish and Game (DFG)	Fish and Game Code Section 1602	Lake and Streambed Alteration Agreement, Notification No. R3-200-0119	July 8, 2002	Dec 31, 20~~14~~10
		Lake and Streambed Alteration Agreement, Notification No. 1600-2009-0361-R3	Jan 21, 2011	Dec 31, 2014
	Fish and Game Code Section 2081 (California Endangered Species Act)	N/A	N/A	N/A
California State Lands Commission	State Lands Act	Lease of State Lands	Various	Various
NOAA National Marine Fisheries Service	Endangered Species Act (ESA) Section 7	Biological Opinion AR: 151422-SWR-01-SR-408	July 3, 2002	July 15, 2012
Central Coast Regional Water Quality Control Board	Porter-Cologne Water Quality Control Act Clean Water Act (CWA) Section 401, Water Quality Certification	Waste Discharge Requirements Order No. R3-2002-0008	March 22, 2002	March 2012
San Francisco Bay Regional Water Quality Control Board	Porter-Cologne Water Quality Control Act CWA Section 401, Water Quality Certification	Waste Discharge Requirements and Water Quality Certification— Order No. R2-2002-0028	Feb 27, 2002	February 2012
San Francisco Bay Conservation and Development Commission	Federal Coastal Zone Management Act of 1972	Permit No. M77-113 Authorization to conduct work in tidal sloughs in Santa Clara County	Feb 8, 1978	June 1, 2015
U.S. Army Corps of Engineers (USACE)	CWA Section 404 Rivers and Harbors Act of 1899, Section 10 NEPA	Permit Number 22525S	August 7, 2002	July 15, 2012
U.S. Fish and	Fish and Wildlife	Biological Opinion Permit	July 5, 2002	July 15, 2012

Table 2-10. Agency Approvals

Agency	Applicable Law/Regulations Guiding Jurisdiction	Current or Prior Permits or Approvals for Maintenance		
		Description	Original Date of Issuance	Date of Expiration
Wildlife Service	Coordination Act Endangered Species Act	Number 22525S		

N/A = Not applicable; the District was not required to obtain a Section 2081 take permit in the 2002 SMP.
Source: Data compiled by Horizon Water and Environment in 2011

Table 2-11. Comparison of Key Differences between 2002 SMP and 2012 SMP Update

Description of Activity	2002 SMP	2012 SMP Update
Bank Stabilization		

Work Window	Generally between July 1 and October 15, 50 percent completed project may extend to October 30.	~~July 1~~ June 15 to October 15. Projects may continue until the approved date stated below ~~50 percent completed projects by October 15 may continue until completion,~~ or until the first ~~5-day~~ 72-hour forecast that includes significant rainfall (greater than 0.5 inch/24 hours).
		• In Creeks Supporting Anadromous Fish
		  ○ An extended work window may occur until October 31st for bank stabilization projects that will be 50% complete by October 15th.
		• In Creeks Not Supporting Anadromous Fish
		  ○ An extended work window may occur until November 30th for projects that will be 50% complete by October 15th or until significant rainfall.
		  ○ An extended work window may occur until November 30th for new bank stabilization projects that will be completed in five (5) days or less, or until significant rainfall.

Exclusions	Does not cover certain bank stabilization methods in high-quality fish or riparian habitat.	Preference is for softscape methods.

Table 2-11. Comparison of Key Differences between 2002 SMP and 2012 SMP Update

Description of Activity	2002 SMP	2012 SMP Update
Methods Table	29 methods (see SMP Manual)	Methods list revised, 9 methods updated (see below), 7 methods eliminated (see Table 2-4): • 1B-Earth Repair with Buried Rock • 2B-Live construction with Log Toe • 3B-Contour Wattling with Log Toe • 4B-Brush Mattress (Brush Layering) with Log Toe • 5B-Surface Matting (Erosion Mats) with Log Toe • 6-Add Rock to Invert • 6A-Rock Cross Vanes • 6D-Log Revetment • 13-Earth with Rock Toe Below OHW
Agency Review Time for Bank Stabilization Designs	45 days for review and response	30 days for review and response
Mitigation Requirements	Based on stream-side impact mitigation matrix and standard success criteria (see BMP 2.4)	Mitigation will be determined via the Bank Stabilization Methods Table and the programmatic mitigation approach for instream complexity. Success criteria to be determined based on specific site conditions reviewed via the Mitigation Feasibility Assessment.
Winterization	Required for active instream work sites if significant rainfall (greater than 0.5 inch/24hours) occurs after October 15.	Considered to occur upon completion of bank repairs or on incomplete projects after October 15 and prior to forecast of significant rainfall (greater than 0.5 inch/24hours)

Table 2-11. Comparison of Key Differences between 2002 SMP and 2012 SMP Update

Description of Activity	2002 SMP	2012 SMP Update
Management of Animal Conflicts		
General	Included as part of "Minor Activities.. Incorporated rodent control using rodenticide, traps, and smoke bombs. Limited detail.	New section of SMP Manual describing in detail, the management of animal conflicts. Now includes: • Maintenance of Sanitary Conditions • Avoidance • Biological control • Physical alterations • Habitat alterations • Non-lethal trapping/relocation; and • Lethal control
Requirements	BMP 3.21 listing of several requirements including: • No rodenticides or fumigant application near salt harvest mouse range, one-half mile of burrowing owl locations, or potential range of sensitive amphibians • Minimization of secondary poisoning impacts including carcass clean-up and surveys	Additional requirements include: • No ~~rodenticides or~~ fumigant application within the current mapped potential range of sensitive amphibians. • Specifically designed bait stations to prevent entry of California ~~T~~tiger ~~S~~salamander, California ~~R~~red-~~L~~legged ~~F~~frog, or ~~F~~foothill ~~Y~~yellow-~~L~~legged ~~F~~frog species~~, or Salt Marsh Harvest Mouse~~. • Live traps will be designed to allow salt marsh harvest mouse to enter and exit easily. • Minimization of secondary poisoning impacts including clean-up and disposal of spilled bait • A 656-yard buffer will be established around known burrowing owl locations where no rodenticides or fumigants (including smoke bombs) will be used. A 0.5-mile buffer will be established around known bald eagle and golden eagle nesting locations where no rodenticides will be used.

Table 2-11. Comparison of Key Differences between 2002 SMP and 2012 SMP Update

Description of Activity	2002 SMP	2012 SMP Update
Minor Maintenance		
Work Activities	Approximately 12 distinct work activities.	Updated list of 11 work activities. Pruning/ vegetation control and animal control activities are no longer classified as Minor Maintenance (included in Vegetation and Animal Conflict management instead)
Definition of Minor	No size limitations described for clearing and minor sediment removal activities	• Cleaning and minor sediment removal activities at facilities/structures are limited to 50 cubic yards • Minor sediment removal less than 10 cubic yards per site may be removed anywhere instream
Mitigation/Limitations	Equivalent area of mitigation provided for annual impacts greater than 0.2 acres to wetland and riparian vegetation removed by minor work activities (or 2 acres for the 10 year program). • Less than 0.01 acre not reported • .01–.05 accounted • 0.2 acre annual max/year • 2 acres max per 10-year permit • Coverage per compensatory mitigation	• See Appendix C for a description of mitigation requirements. • Minor maintenance requirements for annual impacts less than or equal to 0.2 acres per year remain the same.

Table 2-11. Comparison of Key Differences between 2002 SMP and 2012 SMP Update

Description of Activity	2002 SMP	2012 SMP Update
Sediment Removal		

Work Window	Instream work limited to June 15–October 30 or first significant rainfall after October 15 (greater than 0.5 inch/24 hours), whichever occurs first.	June 15-October 15, with extended work window under the following conditions:
		• Creeks Supporting Anadromous Fish:
		An extended work window may occur from October 15 through October 31, or until local rainfall of 0.5 inches or greater falls within the subject watershed within a 24-hour period, whichever occurs first.
		• Creeks Not Supporting Anadromous Fish:
		An extended work window may occur from October 15 through November 30th, or until local rainfall of 0.5 inches or greater falls within the subject watershed within a 24-hour period, whichever occurs first.
		• In lower quality areas, w~~W~~ork may occur after a significant rainfall event but no later than ~~stops at first significant rainfall (0.5 inches of rain in a 24-hr period) or~~ December 31~~, per watershed~~
		  ○ Additional conditions needed for work on Berryessa Creek (0-88+80; 232+70-236+00; 284+30-288+00), Lower Silver Creek (Reach 3 between Stations 37+40 and 381+19), Thompson Creek (0+00-10+00), Canoas Creek (0+00-390+00), Ross Creek (0+00-86+30), Calabazas Creek (35+00-105+00), and San Tomas Aquino Creek (80+00-100+00), after a rainfall event (0.5 inch/24 hours)
		  ○ Sites maintained in a winterized state during extended work window

Vegetation Management		
General Description of Activities	• In-Channel • Upland	• Woody • Herbaceous

Table 2-11. Comparison of Key Differences between 2002 SMP and 2012 SMP Update

Description of Activity	2002 SMP	2012 SMP Update
Pruning Activities	Identified as a means to remove over-hanging growth in upland areas. Removal of instream vegetation by hand can occur between July 1–March 1	• Now defined as a work activity which includes corrective pruning and coppicing, (for both in-channel and upland areas) • Outside the bankfull area, activity may occur year round, weather permitting. • Activity permitted year-round within the instream area except: – Where equipment would need to access a site by crossing a creek or would affect water quality – In steelhead streams - where work would be allowed until Dec. 31 or first significant rainfall occurs (greater than 0.5 inch/24 hours)/watershed, whichever transpires first.
Hand Removal Activities	Described as a means to remove vegetation both in-channel (trees, shrubs, and weeds) and upland areas, less than 6 inches dbh only, everywhere. Removal of instream vegetation by hand can occur between July 1–March 1	Greater description of activity includes: • Hand-removal of woody vegetation occurs for the following reasons: – Maintenance (retain conveyance capacity) – Bank Stabilization – Ecological Health/Stewardship (includes habitat improvement~~, snag removal~~) • Stump treatment is included as hand removal (not considered Herbicide work). • Tree/shrub removal 6–12 inches dbh. Tree removal is subject to removal assessment process and criteria. • Timing same as described for Pruning Activities • “Pay as you go” mitigation • Additional requirements include supervision by qualified specialist for certain pruning types, and tree removal compliance with local tree ordinances.

Table 2-11. Comparison of Key Differences between 2002 SMP and 2012 SMP Update

Description of Activity	2002 SMP	2012 SMP Update
Mechanical Removal	For control of herbaceous vegetation. Includes mowing and discing in upland areas. • Mowing work window=May–October • Discing work window= undefined	Similar, though now includes instream mowing. • Mowing work window= February 1–November 30 • Discing work window= February 1–October 15 • Instream mowing work window= June 15–October 15
Flaming	Not included or described in the SMP.	• Countywide, year-round • Limitations include application by trained staff, no use during periods of high fire danger, and notification to local fire districts upon request prior to use.
Grazing	Not included or described in the SMP	• Where other herbaceous work activity is projected. • Year-round
Herbicide Use	• Limitations in Pajaro River Basin – Allowed only within channel for invasive vegetation removal. • BMPs call for avoidance of serpentine habitats. • Work windows – In aquatic areas July 1-October 15 – Guadalupe River work window July 1-August 15 – No application if rain is forecast within 72 hours – Upland Areas year round except when rain is forecast within 72 hours • Additional guidance – Refer to product label and Endangered Species database for pesticide regulation for use within 1.25 miles of known CRLF areas	Expanded activity location and timing: • Similar application in Santa Clara and Pajaro River Basins • Instream application window June 15-October 15 with extended window until Dec 31 or first significant rainfall (greater than 0.5 inch/24 hours)/watershed, whichever transpires first. • Upland application window year-round, weather permitting • Limitations include – biological clearance required – pest control recommendation – Foliar application only to less than 2 inches dbh and less than 8-foot tall woody vegetation – Application allowed in serpentine areas with additional limitations – Use of aquatic herbicides in CRLF and CTS mapped areas only if creek is dry and no rain forecast for 48 hrs. • Includes use of surfactants on the 14 steelhead streams with additional limitations/considerations

Table 2-12. BMPs Listings

SECTION A –Pre-Project Planning and General BMPs

General BMPs are applicable program-wide, for most routine SMP maintenance activities. These measures include standard construction practices and impact avoidance measures that will minimize potential environmental impacts. These BMPs will be implemented by the stream maintenance crew, as appropriate and as overseen by site managers, for all activities associated with the maintenance program. The majority of these BMPs are implemented prior to and during maintenance operations, though the level of activity varies depending on the work type.

Other General BMPs are conducted prior to implementing maintenance activities on site. This group of measures includes procedures to identify site or maintenance constraints, such as biological or cultural resource surveys which coincide with permit compliance requirements. Site design constraints for sediment and bank stabilization activities in particular are also identified as part of the pre-project planning process.

BMP Number	BMP Title	BMP Description
GEN-1	In-Channel Work Window	All ground-disturbing maintenance activities (i.e., sediment removal, bank stabilization, tree removal, and mechanized vegetation management) occurring in the channel (below bankfull) will take place between June 15 and October 15. Requests for work window extensions must be submitted to the regulatory agencies by October 1st, listing the creek names and reaches where a work extension will occur. Work extensions vary per work activity. The agencies will provide a single response within one week. Significant rainfall applies after October 15. An extension through December 31 may apply if the following requirements are met and regulatory agency approval is received: For ground-disturbing activities: ✦ Work may continue if no significant rainfall, defined as greater than 0.5 inches per 24 hours within a local watershed, is either forecasted[1] or observed. Following October 15th, maintenance work shall cease for the season if such a rain event is forecasted or observed. Sediment removal ✦ Extended Work Window: 1. Creeks Supporting Anadromous Fish: An extended work window may occur from October 15 through October 31, or until local rainfall of 0.5 inches or greater falls within the subject watershed within a 24-hour period, whichever occurs first. 2. Creeks Not Supporting Anadromous Fish: An extended work window may occur from October 15 through November 30th, or until local rainfall of 0.5 inches or greater falls within the subject watershed within a 24-hour period, whichever occurs first. ✦ Extended Work Window in Lower Quality Areas: 1. ~~After a significant rainfall event (0.5 in/24 hrs), s~~Sediment removal work may occur until December 31.

[1] Weather Forecasts. No phase of the project may be started if that phase and its associated erosion control measures cannot be completed prior to the onset of a storm event if that construction phase may cause the introduction of sediments into the stream. Seventy-two-hour weather forecasts from the National Weather Service or other localized and more detailed weather forecast service will be consulted prior to start up of any phase of the project that may result in sediment runoff to a stream.

BMP Number	BMP Title	BMP Description
		2. Work will only occur on Berryessa Creek (0-88+80; 232+70-236+00; 284+30-288+00), Lower Silver Creek (Reach 3 between Stations 37+40 and 381+19), Thompson Creek (0+00-10+00), Canoas Creek (0+00-390+00), ~~and~~ Ross Creek (0+00-86+30), Calabazas Creek (35+00-105+00), and San Tomas Aquino Creek (80+00-100+00) ~~can continue~~ with the following conditions: ○ site conditions are dry and access for all construction equipment and vehicles will not impact waterways; and ○ all work will stop if any rainfall is forecast for the next 72 hour period.~~, and~~ ○ ~~email notification of work status will be provided to regulatory agencies two days in advance of scheduled work.~~ 3. Work may occur after a significant rainfall event but no later than December 31. 4. Sites must be maintained in a rapidly winterizable[1] state (implement control measures BMP GEN-20). Bank stabilization projects ~~that are 50% complete by October 15~~ may continue until the approved date stated below~~completion or until 0.5 inches of rain is predicted in the next 24-hr period~~. Prior to a forecasted significant rainfall event (0.5 in/24 hrs), all incomplete bank stabilization projects must be winterized. 1. In Creeks Supporting Anadromous Fish ○ An extended work window may occur until October 31st for bank stabilization projects that will be 50% complete by October 15th. 2. In Creeks Not Supporting Anadromous Fish ○ An extended work window may occur until November 30th for projects that will be 50% complete by October 15th or until significant rainfall. ○ An extended work window may occur until November 30th for new bank stabilization projects that will be completed in five (5) days or less, or until significant rainfall. ✦ Instream hand pruning and hand removal of vegetation will occur year round, except when: ○ Wheeled or tracked equipment needs to access the site by crossing a creek, ponded area, or secondary channel; or ○ Work occurs in streams that support steelhead. In these streams instream vegetation maintenance will cease on December 31 or when local rainfall greater than 0.5 inches is predicted within a 24-hour period of planned activities, whichever happens first. Modification and removal of instream large woody debris will occur at any time of the year, and as further described in the NMFS Biological Opinion. ~~if imminent danger of a flood threat precludes leaving the wood in place.~~
GEN-2	Instream Herbicide Application Work Window	Instream herbicide applications will take place between June 15 and October 15~~31~~, with an extension through December 31 or until the first occurrence of any of the following conditions; whichever happens first: ✦ local rainfall greater than 0.5 inches is forecasted within a 24-hour period from planned application events; or ✦ when steelhead begin upmigrating and spawning in the 14 steelhead creeks, as determined by a qualified

[1] Winterization is the process to maintain work sites with the appropriate BMP's to prevent erosion, sediment transport, and protect water quality. Winterization occurs upon completion of bank repairs or on incomplete projects after October 15 and prior to the forecast of significant rainfall, 0.5 inches or greater of local watershed rainfall within 24 hours. Winterization shall be completed prior to the occurrence of such actual significant rainfall.

BMP Number	BMP Title	BMP Description
		biologist (typically in November/December), ○ A qualified biologist will determine presence/absence of sensitive resources in designated herbicide use areas and develop site-specific control methods (including the use of approved herbicide and surfactants). Proposed herbicide use would be limited to the aquatic formulation of glyphosate (Rodeo or equal). Surfactant use would be limited to non-ionic products, such as Agri-dex, Competitor, or another brand name using the same ingredients. Any modifications to these materials would require review and approval by NMFS and CDFG. ○ A qualified fisheries biologist will review proposed herbicide application methods and stream reaches. The fisheries biologist would conduct a pre-construction survey (and any other appropriate data research) to determine whether the proposed herbicide application is consistent with SMP approvals concerning biological resources and determine which BMPs would be instituted for work to proceed. In addition, herbicide application requirements are as follows: ✦ no direct application into water; ✦ herbicide application shall not occur when wind conditions may result in drift; ✦ herbicide shall only be applied after the surfactant has a "wet" appearance on the target plants in order to avoid run off; and ✦ where permitted, surfactants shall be added to the spray solution prior to application.
GEN-3	Avoid Exposing Soils with High Mercury Levels	Sediment removal and bank stabilization projects in portions of the Guadalupe River watershed affected by historic mercury mining may expose soils containing mercury. 1. In specified maintenance reaches in the Guadalupe River Basin, soils that are likely to be disturbed or excavated shall be tested for mercury (Hg). Soils shall be remediated if: a. disturbed or excavated soils exposed to streamflow below the elevation of the 2.33-year flow event exceed 1 ppm Hg; or b. disturbed or excavated soils above the 2.33-year flow level exceed 20 ppm Hg. 2. Remediation may be accomplished either by: a. treating the site so that contaminated soils excavated for the purpose of bank stabilization shall not be susceptible to erosion; or b. further excavating contaminated soils and replacing them with clean fill or other bank stabilization materials that are free from contaminants. c. Soils with mercury concentrations exceeding 20 mg/kg shall be removed and disposed of in a Class I landfill following established work practices and hazard control measures. Soils with mercury concentrations less than 20 mg/kg will remain at the project site. 3. To ensure worker safety during sediment removal and bank stabilization projects with elevated mercury concentrations in the exposed surfaces, personal protective equipment will be required during project construction to maintain exposure below levels established by the Occupational Safety and Health Agency (OSHA).

Biological Resources

GEN-4	Minimize the Area of	To minimize impacts to natural resources, soil disturbance will be kept to the minimum footprint necessary to

BMP Number	BMP Title	BMP Description
	Disturbance	complete the maintenance operation.
GEN-5	Mitten Crab Control Measure	Sediment from the San Francisco Bay Watershed, including that for reuse, cannot be moved to areas any farther south than Coyote Creek Golf Drive in south San Jose, and the intersection of McKean and Casa Loma Roads.
GEN-6	Minimize Impacts to Nesting Birds via Site Assessments and Avoidance Measures	1. For activities occurring between January 15 and August 31, project areas will be checked by a qualified biologist or Designated Individuals (DI – for limited ground nesting species surveys),~~f~~or nesting birds within 2 weeks prior to starting work. If a lapse in project-related work of 2 weeks or longer occurs, another focused survey will be conducted before project work can be reinitiated. 2. If nesting birds are found, a buffer will be established around the nest and maintained until the young have fledged. Appropriate buffer widths are 0.5 mile for bald and golden eagles; 250 feet for other raptors and the least Bell's vireo, herons, and egrets; 25 feet for ground-nesting non-raptors; and 50 feet for non-raptors nesting on trees, shrubs and structures. A qualified biologist may identify an alternative buffer based on a site specific-evaluation. No work within the buffer will occur without written approval from a qualified biologist, for as long as the nest is active. 3. All vegetation management, sediment reuse, road grading, or other SMP activities in or immediately adjacent to suitable California clapper rail or Alameda song sparrow nesting habitat, as determined by a qualified biologist, shall not be conducted prior to September 1 (the non-nesting season). 4. If a pre-activity survey in high-quality San Francisco common yellowthroat breeding habitat (as determined by a qualified biologist) identifies more singing male San Francisco common yellowthroats than active nests, then the inconspicuous nests of this species might have been missed. In that case, maintenance activities in that area shall be delayed until the San Francisco common yellowthroat non-breeding season (i.e., August 16–March 14). 5. The boundary of each buffer zone will be marked with fencing, flagging, or other easily identifiable marking if work will occur immediately outside the buffer zone. 6. All protective buffer zones will be maintained until the nest becomes inactive, as determined by a qualified biologist. 7. If monitoring shows that disturbance to actively nesting birds is occurring, buffer widths will be increased until monitoring shows that disturbance is no longer occurring. If this is not possible, work will cease in the area until young have fledged and the nest is no longer active.
GEN-6.5	Protection of Nesting Least Bell's Vireos	1. To the extent feasible, SMP activities within woody riparian habitat along portions of lower Llagas Creek downstream from Highway 152, the Pajaro River from Llagas Creek downstream, and lower Uvas/Carnadeo Creek downstream from Hecker Pass Road shall be scheduled to occur outside of the least Bell's vireo nesting season (March 15 – July 31). 2. For activities within woody riparian habitat along the aforementioned creek reaches that will occur between March 15 and July 31, any work will be preceded by a focused survey for least Bell's vireos. Pre-activity surveys will consist of two site visits, conducted on separate days within 14 days before the initiation of maintenance activities in the given area, with at least one of these surveys occurring within 7 days before the initiation of such activities. Surveys will be conducted between dawn and 11:00 a.m., during mild weather conditions (i.e., not during excessive cold, heat, wind, or rain), within all riparian habitat in and within 250 feet of any proposed maintenance location along these reaches. The surveys will be conducted by a qualified biologist who is familiar with the visual and auditory identification of this species.

BMP Number	BMP Title	BMP Description
		3. To minimize impacts to nesting least Bell's vireos and other birds, the biologist will not initially be looking for Bell's vireo nests during these surveys. Rather, the biologist will look and listen for individual vireos. If a least Bell's vireo is detected, it will be observed to determine whether it is actively nesting. The biologist will note the nest location, or if finding the actual nest could result in excessive disturbance or risk damaging the nest, the biologist will determine the approximate location, based on observation of birds carrying nesting material, carrying food, or repeatedly visiting a certain area. 4. If an active nest is found, a minimum 250-foot no-activity buffer will be established around the nest. If a territorial male is found but no nest can be detected, then the approximate centroid of the bird's area of activity will be the point from which the buffer will be applied. The required buffer may be reduced in areas where dense riparian forest occurs between the construction activities and the active nest or where sufficient barriers or topographic relief exists to protect the nest from excessive noise or other disturbance. The biologist will coordinate with the USFWS and CDFG to evaluate exceptions to the minimum no-activity buffer distance on a case-by-case basis. 5. No work will occur within the buffer without verification by a biologist that the nest is inactive and until any fledged young are no longer dependent on adults for food.
GEN-7	Protection of Burrowing Owls	1. ~~If burrowing owls are present, then w~~Work within 250 feet of an occupied burrow will be delayed until after the nesting season. 2. If suitable burrowing owl habitat is identified where mowing is proposed, or active burrows are found, they will be marked in such a way that the mower can identify the locations of such burrows. Mowing can then occur anywhere beyond the 250 foot buffer zone. Within the 250 foot buffer zone mowing may be done to within 10 feet of an active burrow provided there are~~is~~ no burrowing owls active on the surface. An on-site monitor will observe the area in front of the mower from a safe vantage point while it is in operation. In areas within 10 ft of active burrows the vegetation may be removed by hand (e.g., weed-whackers). All mowing and hand-removal of vegetation within 250 ft of a burrow will be done as quickly as possible to minimize disturbance of burrowing owls. 3. All markers will be removed once mowing is complete. 4. For burrow destruction work, all burrows within the 250-foot buffer zone around known, occupied burrows will be inspected with a burrow camera prior to destruction to ensure no entrapment of burrowing owls. Burrows that are difficult to inspect due to intricate subterranean configuration or depth will be inspected in stages where the uninspected section of the burrow will be protected while the previously inspected section is excavated. If maintenance activities will directly impact occupied burrows the District will consult with the DFG and FWS on establishing alternative burrows (including artificial burrows) and a process for removing owls from the active burrow. No burrowing owls will be evicted from burrows during the nesting season.
GEN-8	Protection of Sensitive Fauna Species from Herbicide Use	Approved herbicides and adjuvants may be applied in habitat areas for sensitive wildlife species (including steelhead, California red-legged frog, California tiger salamander, salt marsh harvest mouse, and Bay checkerspot butterfly); all applications will occur in accordance with federal and state regulations. For sprayable or dust formulations: when the air is calm or moving away from sensitive wildlife habitat, applications will commence on the side nearest the habitat and proceed away from the habitat. When air currents are moving toward habitat, applications will not be made within 200 yards by air or 40 yards by ground upwind from occupied

BMP Number	BMP Title	BMP Description
		habitat. However, these distances may be modified for the control of invasive species on salmonid streams if the following measures are implemented: ✦ A qualified biologist will determine presence/absence of sensitive resources in designated herbicide use areas and develop site-specific control methods (including the use of approved herbicide and surfactants). Proposed herbicide use would be limited to the aquatic formulation of glyphosate (Rodeo or equal). Surfactant use would be limited to non-ionic products, such as Agri-dex, Competitor, or another brand name using the same ingredients. Any modifications to these materials would require review and approval by NMFS and CDFG. ✦ A qualified fisheries biologist will review proposed herbicide application methods and stream reaches. The fisheries biologist would conduct a pre-construction survey (and any other appropriate data research) to determine whether the proposed herbicide application is consistent with SMP approvals concerning biological resources and determine which BMPs would be instituted for work to proceed.
GEN-9	Avoid Impacts to Special-Status Plant Species and Sensitive Natural Vegetation Communities	A qualified botanist will identify special status plant species and sensitive natural vegetation communities and clearly map or delineate them as needed in order to avoid and/or minimize disturbance, using the DFG protocols and the *CNPS Botanical Survey Guidelines* to formulate the following protocols: 1. A qualified botanist will use the GIS database, CNDDB, and/or other suitable tools to identify special status plants and sensitive natural vegetation communities located within or near work areas. 2. Surveys of areas identified as sensitive natural communities or suitable habitat for special status plant species will be conducted by a qualified botanist prior to commencement of work. 3. Surveys will be conducted during the appropriate time of the year to adequately identify special-status plants that could occur on the site of proposed maintenance activities. 4. The qualified botanist will ensure avoidance and/or minimize impacts by implementing one or more of the following, as appropriate, per the botanist's recommendation: a) Flag or otherwise delineate in the field the special status plant populations and/or sensitive natural community to be protected; b) Allow adequate buffers around plants or habitat; the location of the buffer zone will be shown on the maintenance design drawings and marked in the field with stakes and/or flagging in such a way that exclusion zones are visible to maintenance personnel without excessive disturbance of the sensitive habitat or population itself (e.g., from installation of fencing). c) Time construction or other activities during dormant and/or non-critical life cycle period; d) Store removed sediment off site; and e) Limit the operation of maintenance equipment to established roads whenever possible. 5. No herbicides, terrestrial or aquatic, will be used in areas identified as potential habitat for special status plant~~s~~ species or containing sensitive natural communities, until a qualified botanist has surveyed the area and determined the locations of special status plant species present. 6. If special status plant species or sensitive communities are present, then a qualified botanist will determine if a given type of vegetation management method is ecologically appropriate for a given area. Alternative strategies based on the botanist's recommendations will be coordinated with appropriate staff. 7. All impacts to sensitive natural communities and special status plants identified by the qualified botanist will be avoided and/or minimized

BMP Number	BMP Title	BMP Description
GEN-10	Avoid Impacts to Bay Checkerspot Butterfly and Associated Critical Habitat	1. Areas supporting Bay checkerspot larval host plants will be identified by a qualified botanist and protected from disturbance to the extent feasible, by establishing buffer zones around individual plants or populations. The size of the buffer will be determined by a qualified botanist; the actual distance will depend on the plant species potentially affected and the type of disturbance. No herbicide will be applied to the buffer area, and to the extent feasible, maintenance personnel and equipment will not operate within such areas. 2. Herbicides may be used in serpentine areas that do not contain Bay checkerspot butterfly larval host plants or sensitive plant species and habitat when approved by a qualified botanist and for the following maintenance purposes: a) To protect sensitive species and habitat; b) To manage for control of invasive and non-native plants; and/or c) To maintain access to a facility.
GEN-11	Protection of Salt Marsh Harvest Mouse and California Clapper Rail	1. A District qualified biologist will conduct a desk audit to determine whether suitable Salt Marsh Harvest Mouse (SMHM) or California Clapper Rail (CCR) habitat is present in or adjacent to a maintenance activity. 2. Within 7 days prior to work within the range of the Salt Marsh Harvest Mouse (SMHM) or California Clapper Rail (CCR), as depicted on the District's GIS layers, the proposed project area will be surveyed by a qualified biologist to identify specific habitat areas. Surveyed areas will include work locations and access routes. 3. To minimize or avoid the loss of individuals, activities within or adjacent to California clapper rail and salt marsh harvest mouse habitat will not occur within two hours before or after extreme high tides (6.5 feet or above) when the marsh plain is inundated, because protective cover for those species is limited and activities could prevent them from reaching available cover. 4. Specific habitat areas are vegetated areas of cordgass (*Spartina* spp), marsh gumplant (*Grindelia* spp.), pickleweed (*Sarcocornia pacifica*), alkali heath, (*Frankenia* sp.), and other high marsh vegetation, brackish marsh reaches of creek with heavy accumulations of bulrush thatch (old stands), and high water refugia habitat that may include annual grasses, and shrubs immediately adjacent to channels. 5. Within the identified specific habitat areas, vegetation will be removed by hand from areas to be directly impacted by the work activities if possible (hand removal of vegetation in some channels may not be possible). 6. Prior to the initiation of work each day for all vegetation management work, ground or vegetation disturbance, operation of large equipment, grading, sediment removal, and bank stabilization work and prior to expanding the work area, if suitable habitat occurs within the immediate work area, a qualified biologist will conduct a pre-construction survey of all suitable habitat that may be directly or indirectly impacted by the day's activities (work area, access routes, staging areas). a. If during the initial daily survey or during work activities a CCR is observed within or immediately adjacent to the work area (50 feet), initiation of work will be delayed until the CCR leaves the work area. b. If during the initial daily survey or during work activities a SMHM or similar rodent is observed within or immediately adjacent to the work area (50 feet), initiation of work will be delayed until a *Site Specific Species Protection Form* can be developed and implemented by a qualified biologist to protect the SMHM or similar rodent is developed and implemented by the qualified biologist. Acceptable plan activities may include one or more of the following activities: 1) establishment of a buffer zone at least 50 feet in radius from the rodent; 2) ongoing active monitoring, 3) construction of silt fence barrier between

BMP Number	BMP Title	BMP Description
		maintenance work and location of the rodent, 4) delay of work activity until the qualified biologist can contact DFG and USFWS for additional direction. 7. Mowing using heavy equipment (tractors, boom mowers, rider mowers) will not be conducted in habitat areas or within 50 feet of habitat areas. If mowing with hand equipment is necessary within 50 feet of habitat areas, an on-site monitor will observe the area in front of the mower from a safe vantage point while it is in operation. If SMHM are detected within the area to be mown, no mowing will occur in that area. If CCR are detected within the area to be mown, the mowing will stop until the individual(s) have left the work area. 8. See ANI-2 for additional restrictions.
GEN-12	Protection of Special-Status Amphibian and Reptile Species	1. A District qualified biologist will conduct a desk audit to determine whether suitable special-status amphibian or reptile habitat is present in or adjacent to a maintenance activity. 2. If the District Wildlife or Fisheries Biologist determines that a special-status amphibian or reptile could occur in the activity area, a qualified biologist will conduct one daytime survey within a 7 day period preceding the onset of maintenance activities. a. If a special-status amphibian or reptile, or the eggs or larvae of a special status amphibian or reptile,- ~~is~~~~are~~ found within the activity area during a pre-activity survey or during project activities, the qualified biologist shall notify the project proponent about the special-status species and conduct the following work specific activities: i. For minor maintenance activities and for vegetation removal activities that will take less than 1 day, the qualified biologist shall conduct a special status species survey on the morning of and prior to the scheduled work. A. If no special status species is found, the work may proceed. B. If eggs or larvae of a special status species are found, a buffer will be established around the location of the eggs/larvae and work may proceed outside of the buffer zone. No work will occur within the buffer zone. Work within the buffer zone will be rescheduled until the time that eggs have hatched and/or larvae have metamorphosed. C. If an active western pond turtle nest is detected within the activity area, a ~~25~~ 50-foot buffer zone around the nest will be established and maintained during the breeding and nesting season (April 1 – August 31). The buffer zone will remain in place until the young have left the nest, as determined by a qualified biologist. D. If adults or non-larval juveniles of a special status species are found, one of the following two procedures will be implemented: i. If, in the opinion of the qualified biologist, capture and removal of the individual to a safe place outside of the work area is less likely to result in adverse effects than leaving the individual in place and rescheduling the work (e.g., if the species could potentially hide and be missed during a follow-up survey), the individual will be captured and relocated by a qualified biologist (with USFWS and/or CDFG approval, depending on the listing status of the species in question), and work may proceed. ii. If, in the opinion of the qualified biologist, the individual is likely to leave the work area on its own, and work can be feasibly rescheduled, a buffer will be established around

BMP Number	BMP Title	BMP Description
		the location of the individual(s) and work may proceed outside of the buffer zone. No work will occur within the buffer zone. Work within the buffer zone will be rescheduled. ii. For minor maintenance and vegetation removal activities that will take more than 1 day, the qualified biologist shall conduct a special-status species survey on each morning of and prior to the scheduled work commencing. E. If eggs or larvae of a special status species are found, a buffer will be established around the location of the eggs/larvae and work may proceed outside of the buffer zone. No work will occur within the buffer zone. Work within the buffer zone will be rescheduled until the time that eggs have hatched and/or larvae have metamorphosed. F. If an active western pond turtle nest is detected within the activity area, a ~~25~~50 ft-buffer zone around the nest will be established and maintained during the breeding and nesting season (April 1 – August 31). The buffer zone will remain in place until the young have left the nest, as determined by a qualified biologist. G. If adults or non-larval juveniles of a special status species are found, the individual will be captured and relocated by a qualified biologist (with USFWS and/or CDFG approval, depending on the listing status of the species in question), and work may proceed. iii. For Sediment Removal and Bank Stabilization Projects the wildlife or fisheries biologist in cooperation with the project proponent shall complete a *Site Specific Species Protection Form for the project*. Elements of the form include: work rescheduling, training work crews, daily surveys, establishment of buffers and buffer fencing, on-site monitoring, habitat modification in advance of work activities, capture and relocation of individual special-status species, methods of documentation, and reporting of results. b. If no special status amphibian or reptile is found within the activity area during a pre-activity survey, the work may proceed. c. During animal conflict management activities, if special status species are found within a burrow proposed for destruction, a qualified biologist will determine an appropriate buffer distance around that burrow to ensure adequate protection of the habitat. The buffer area may include not destroying adjacent burrows as that may damage subterranean networks of the occupied burrow or produce substrate vibrations which could interfere with prey detection mechanisms. If two consecutive follow up surveys are conducted (spaced 30 days apart) in which the burrow is found to be unoccupied, work can proceed as planned. A naturally found back filled burrow known to have been inhabited by a special-status species will be presumed to still be occupied by that species and a clearly delineated buffer demarcation of the burrow area will be in place for the duration of nearby work activities. In rare instances in which destruction of the burrow is not avoidable during animal conflict management, the animal will be relocated to a safe burrow outside the impact area, with USFWS and/or CDFG approval, depending on the listing status of the species in question. A biologist will observe the relocated animal until it is certain that the animal is not in immediate danger of desiccation or predation.

BMP Number	BMP Title	BMP Description
GEN-13	Protection of Bat Colonies	1. A District Wildlife Biologist will conduct a desk audit to determine whether suitable habitat (appropriate roost trees or anthropogenic structures) is present for bat colonies within 100 feet of the work site, staging areas, or access routes. 2. If potential bat colony habitat is determined to be present, within two weeks prior to the onset of work activities a qualified biologist will conduct a survey to look for evidence of a bat use. If evidence is observed, or if potential roost sites are present in areas where evidence of bat use might not be detectable (such as a tree cavity), an evening survey and/or nocturnal acoustic survey may be necessary to determine if the bat colony is active and to identify the specific location of the bat colony. 3. If an active bat maternity colony is present then the qualified biologist will make the following determinations: a. The work can proceed without unduly disturbing the bat colony b. There is a need for a buffer zone to prevent disturbance to the bat colony, and implementation of the buffer zone (determined on a case-by-case basis by a qualified biologist) will reduce or eliminate the disturbance to an acceptable level. c. Work cannot proceed without unduly disturbing the bat colony; thus, the work will be postponed until after July 31. 4. If a non-breeding bat hibernaculum is found in a tree or structure that must be removed or physically disturbed, the qualified biologist will consult with DFG prior to initiating any removal or exclusion activities.
GEN-14	Protection of San Francisco Dusky-footed Woodrat	1. Prior to work within riparian, oak woodland, or coyote brush scrub habitat, or the removal of any oak trees outside these habitats, a District Wildlife Biologist will conduct a desk audit to determine whether woodrats could be present within suitable habitat for San Francisco dusky-footed woodrat or is known to be present in or adjacent to a maintenance activity site. 2. If the District Wildlife Biologist determines that no San Francisco dusky-footed woodrat habitat is present, or there is habitat present but will not be affected by the maintenance activity, then no further action is required. 3. If the District Wildlife Biologist determines that suitable San Francisco dusky-footed woodrat habitat is present and may be affected by the maintenance activity, a qualified biologist shall conduct a pre-activity survey within 2 weeks prior to the start of work to determine if woodrat nests are in, or within 5 feet of, the immediate activity area. a. If woodrat nests are present at the site and will be affected by the work activity area, the District Wildlife Biologist in cooperation with the project proponent will evaluate the site specific situation. The Wildlife Biologist will then develop a site specific woodrat management plan to first avoid and second minimize take or injury of the woodrat(s). The woodrat management plan may include: establishment of buffers zones, installation of buffer zone fences, relocation of the woodrat nest, removal of the woodrat nest, and/or construction of artificial nests. Consideration will be given to the number of woodrat nests that may be affected by the work activity and the number in the project vicinity that may not be affected.

BMP Number	BMP Title	BMP Description
GEN-15	Salvage Native Aquatic Vertebrates from Dewatered Channels	If fisheries or native aquatic vertebrates are present when cofferdams, water bypass structures, and silt barriers are to be installed, a fish and native aquatic vertebrate relocation plan shall be implemented to ensure that fish and native aquatic vertebrates are not stranded. Relocation efforts will be based on the District's Fish Relocation Guidelines. Streams that support a sensitive species (i.e. steelhead) will require a relocation effort and/ or initial onsite monitoring by a qualified biologist depending on seasonal conditions: 1. In non-tidal channels, where water is to be diverted, prior to the start of work or during the installation of water diversion structures, native aquatic vertebrates shall be captured in the work area and transferred to another reach as determined by a qualified biologist. Timing of work in streams that supports a significant number of amphibians will be delayed until metamorphosis occurs to minimize impacts to the resource. Capture and relocation of aquatic native vertebrates is not required at individual work sites when site conditions preclude reasonably effective operation of capture gear and equipment. 2. Aquatic invertebrates will not be transferred (other than incidental catches) because of their anticipated abundance and colonization after completion of the repair work.
GEN-15.5	Avoidance of Impacts on the San Joaquin Kit Fox	1. A qualified District biologist will conduct a desk audit to determine whether an SMP activity will occur in an area where the San Joaquin kit fox could potentially occur (i.e., roughly east of Frazier Lake Road and south of Bloomfield Avenue), and in potential habitat for the species. 2. If the District biologist determines that an SMP activity could occur in an area that could potentially support a kit fox, the SCVWD will implement applicable pre-activity surveys and other measures in accordance with the USFWS's *San Joaquin Kit Fox Survey Protocol for the Northern Range*, as follows: a) Conduct a preconstruction/pre-activity survey no less than 14 days and no more than 30 days prior to the beginning of project implementation. Surveys shall identify kit fox habitat features on the project site and evaluate use by kit fox and, if possible, and assess the potential impacts to the kit fox by the proposed activity. The status of all dens shall be determined and mapped in accordance with the survey protocol. b) If a natal/pupping den is discovered within the project area or within 200 feet of the project boundary, the USFWS shall be immediately notified. Disturbance to all San Joaquin kit fox dens should be avoided to the maximum extent possible. Destruction of any known or natal/pupping kit fox den would require take authorization from the USFWS. c) The project proponent will establish exclusion zones around the kit fox dens, if determined to be present. The configuration of the exclusion should have a radius measured outward from the entrance or cluster of entrances. The following radii are minima to be applied: ✦ Potential den: 50 feet ✦ Known den: 100 feet ✦ Natal/pupping den: Service must be contacted (occupied and unoccupied) ✦ Atypical den: 50 feet. 3. <u>If take of the San Joaquin kit fox will occur, take authorization from the USFWS and CDFG will be necessary.</u>

BMP Number	BMP Title	BMP Description
General Maintenance Practices		
GEN-16	In-Channel Minor Activities	For in-channel minor work activities, work will be conducted from the top of the bank if access is available and there are flows in the channel.
GEN-17	Employee/Contractor Training	All appropriate District staff and contractors will receive annual training on Stream Maintenance Program BMPs. The training will also include an overview of special-status species identification and habitat requirements. District staff and contractors will receive fact sheets to assist with in-the-field identification of special-status species and their habitats.
GEN-18	Paperwork Required On-site	1. Copies of regulatory permits related to the Stream Maintenance Program will be kept on-site and available for review, if requested by regulatory personnel. 2. Copies of the Stream Maintenance Program Manual and this BMP Manual will be kept on-site.
GEN-19	Work Site Housekeeping	1. District employees and contractors will maintain the work site in neat and orderly conditions on a daily basis, and will leave the site in a neat, clean, and orderly condition when work is complete. 2. Slash, sawdust, cuttings, etc. will be removed to clear the site of vegetation debris. As needed, paved access roads and trails will be swept and cleared of any residual vegetation or dirt resulting from the maintenance activity. 3. For activities that last more than one day, materials or equipment left on the site overnight will be stored as inconspicuously as possible, and will be neatly arranged. Any materials and equipment left on the site overnight will be stored to avoid erosion, leaks, or other potential impacts to water quality (see BMPs GEN-24). 4. The District's maintenance crews are responsible for properly removing and disposing of all debris incurred as a result of construction within 72 hours of project completion. 5. All trash that is brought to a project site during maintenance activities (e.g., plastic water bottles, plastic lunch bags, cigarettes) will be collected at the site daily.
GEN-20	Erosion and Sediment Control Measures	1. Soils exposed due to maintenance activities will be seeded and stabilized using hydroseeding, straw placement, mulching, and/or erosion control fabric. These measures will be implemented such that the site is stabilized and water quality protected prior to significant rainfall. The channel bed and areas below the Ordinary High Water Mark (OHWM) are exempt from this BMP. 2. The preference for erosion control fabrics will be to consist of natural fibers; however, steeper slopes and areas that are highly erodible may require more structured erosion control methods. No non-porous fabric will be used as part of a permanent erosion control approach. Plastic sheeting may be used to temporarily protect a slope from runoff, but only if there are no indications that special-status species would be impacted by the application. 3. Erosion control measures will be installed according to manufacturer's specifications. 4. Appropriate measures include, but are not limited to, the following: o Silt Fences o Straw Bale Barriers o Brush or Rock Filters o Storm Drain Inlet Protection o Sediment Traps o Sediment Basins

BMP Number	BMP Title	BMP Description
		○ Erosion Control Blankets and Mats ○ Soil Stabilization (i.e. tackified straw with seed, jute or geotextile blankets, etc.) ○ Wood chips ○ Straw mulch 5. All temporary construction-related erosion control methods shall be removed at the completion of the project (e.g. silt fences). 6. Surface barrier applications installed as a method of animal conflict management, such as chain link fencing, woven geotextiles, and other similar materials, will be installed no longer than 300 feet, with at least an equal amount of open area prior to another linear installation; and only on one side of levee slopes. Inboard and outboard areas will only have installations set in an alternating pattern, such that no inboard and outboard levee faces would have erosion control blankets along the same levee stationing.
GEN-21	Staging and Stockpiling of Materials	1. To protect on-site vegetation and water quality, staging areas should occur on access roads, surface streets, or other disturbed areas that are already compacted and only support ruderal vegetation. Similarly, all maintenance equipment and materials (e.g., road rock and project spoil) will be contained within the existing service roads, paved roads, or other pre-determined staging areas. 2. Building materials and other maintenance-related materials, including chemicals and sediment, will not be stockpiled or stored where they could spill into water bodies or storm drains. Materials will not be stockpiled longer than seven (7) calendar days. 3. No runoff from the staging areas may be allowed to enter water ways, including the creek channel or storm drains, without being subjected to adequate filtration (e.g., vegetated buffer, swale, hay wattles or bales, silt screens). 4. The discharge of decant water to water ways from any on-site temporary sediment stockpile or storage areas is prohibited. 5. Wet material removed from an isolated creek reach may be pulled to the side of the channel (within the channel and below top of bank) and allowed to naturally drain prior to removal from the channel. Pulled material will be removed from the channel prior to deactivation of the site or forecast of rain. 6. During the wet season, no stockpiled soils will remain exposed, unless surrounded by properly installed and maintained (i.e., per manufacturer specifications) silt fencing or other means of erosion control. During the dry season; exposed, dry stockpiles will be watered, enclosed, covered, or sprayed with non-toxic soil stabilizers (GEN-24). 7. All pipes, culverts, or similar structures stored at a site within sensitive species areas, for one or more overnight periods shall be securely capped prior to storage or inspected before the pipe is subsequently moved. If any potential special-status species are observed within a pipe, a District biologist shall be consulted on what steps should be taken to protect the species. If a District biologist is on-site, they may remove the special status species from the pipes and relocate to the nearest appropriate and unaffected habitat.

BMP Number	BMP Title	BMP Description
GEN-22	Sediment Transport	To prevent sediment-laden water from being released back into waterways during transport of spoils to disposal locations, truck beds will be lined with an impervious material (e.g., plastic), or the tailgate blocked with wattles, hay bales, or other appropriate filtration material. Trucks may then drain excess water by slightly tilting the loads and allowing the water to drain out through the applied filter, but only within the active project area of the creek where the sediment is being loaded into the trucks or within an identified vegetated area (swale) that is separated from the creek.
GEN-23	Stream Access	District personnel will use existing access ramps and roads to the extent feasible. If necessary to avoid large mature trees, native vegetation, or other significant habitat features, temporary access points will be constructed in a manner that minimizes impacts according to the following guidelines: 1. Temporary access points will be constructed as close to the work area as possible to minimize equipment transport 2. In considering channel access routes, slopes of greater than 20 percent will be avoided, if possible. 3. Any temporary fill used for access will be removed upon completion of the project and pre-project topography will be restored to the extent possible. 4. When temporary access is removed, disturbed areas will be revegetated or filled with compacted soil, seeded, and/or stabilized with erosion control fabric immediately after construction to prevent future erosion. 5. Personnel will use the appropriate equipment for the job that minimizes impacts and disturbance to the stream bottom. Appropriately-tired vehicles, either tracked or wheeled, will be used depending on the site and maintenance activity.
GEN-24	On-Site Hazardous Materials Management	1. An inventory of all hazardous materials used (and/or expected to be used) at the worksite and the end products that are produced (and/or expected to be produced) after their use will be maintained by the worksite manager. 2. As appropriate, containers will be properly labeled with a “Hazardous Waste” label and hazardous waste will be properly recycled or disposed of off-site. 3. Contact of chemicals with precipitation will be minimized by storing chemicals in watertight containers with appropriate secondary containment to prevent any spillage or leakage. 4. Quantities of toxic materials, such as equipment fuels and lubricants, will be stored with secondary containment that is capable of containing 110% of the primary container(s). 5. Petroleum products, chemicals, cement, fuels, lubricants, and non-storm drainage water or water contaminated with the aforementioned materials will not contact soil and not be allowed to enter surface waters or the storm drainage system. 6. All toxic materials, including waste disposal containers, will be covered when they are not in use, and located as far away as possible from a direct connection to the storm drainage system or surface water. 7. Sanitation facilities (e.g., portable toilets) will be placed outside of the creek channel and floodplain. Direct connections with soil, the storm drainage system, and surface waters will be avoided. 8. Sanitation facilities will be regularly cleaned and/or replaced, and inspected daily for leaks and spills..
GEN-25	Existing Hazardous Materials	If hazardous materials, such as oil, batteries or paint cans, are encountered at the maintenance sites, the District will carefully remove and dispose of them according to applicable regulatory requirements. District staff will wear proper protective gear and store the waste in appropriate hazardous waste containers until it can be disposed at a hazardous waste facility.

BMP Number	BMP Title	BMP Description
GEN-26	Spill Prevention and Response	The District will prevent the accidental release of chemicals, fuels, lubricants, and non-storm drainage water into channels following these measures: 1. District field personnel will be appropriately trained in spill prevention, hazardous material control, and clean up of accidental spills. 2. Equipment and materials for cleanup of spills will be available on site and spills and leaks will be cleaned up immediately and disposed of according to applicable regulatory requirements. 3. Field personnel will ensure that hazardous materials are properly handled and natural resources are protected by all reasonable means. 4. Spill prevention kits will always be in close proximity when using hazardous materials (e.g., at crew trucks and other logical locations). All field personnel will be advised of these locations. 5. District staff will routinely inspect the work site to verify that spill prevention and response measures are properly implemented and maintained. *Spill Response Measures:* For small spills on impervious surfaces, absorbent materials will be used to remove the spill, rather than hosing it down with water. For small spills on pervious surfaces such as soil, the spill will be excavated and properly disposed rather than burying it. Absorbent materials will be collected and disposed of properly and promptly. If a hazardous materials spill occurs that cannot be contained or cleaned up with the onsite materials, the onsite District field personnel will be responsible for immediately initiating an emergency response sequence by notifying the proper authorities (i.e., District Emergency Response (ER) Team and public fire and hazmat agencies) of the release; taking appropriate defensive steps from a safe distance to secure the site to minimize damage to people, environment, and property (PEP); and deferring all other response activities to public emergency response agencies and/or the District Emergency Response (ER) Team or District ER Contractor. Depending on the nature of the release, the District ER Team's actions will include: urgent (responding within 2 hours of notification) field response site reconnaissance, emergency sequence initiation, defensive containment, release control, incident command; or priority (non 2-hour) field response site reconnaissance and clean-up operations. If a "reportable" spill of petroleum products occurs, the District's Stream Maintenance Implementation Program Manager will be notified and action taken to contact the appropriate safety and cleanup crews. A reportable spill is defined as when: ✦ a film or sheen on, or discoloration of, the water surface or adjoining bank/shoreline is observed; or ✦ a sludge or emulsion is deposited beneath the surface of the water or adjoining banks/shorelines (40 Code of Federal Regulations 110); or when ✦ another violation of water quality standards is observed. A written description of the reportable release must be submitted to the appropriate Regional Water Quality Control Board and the California Department of Toxic Substances Control (DTSC). This submittal must contain a description of the release, including the type of material and an estimate of the amount spilled, the date of the release, an explanation of why the spill occurred, and a description of the steps taken to prevent and control future releases. If an appreciable spill has occurred, and results determine that project activities have adversely affected surface

BMP Number	BMP Title	BMP Description
		water or groundwater quality, a detailed analysis will be performed to the specifications of DTSC to identify the likely cause of contamination. This analysis will include recommendations for reducing or eliminating the source or mechanisms of contamination. Based on this analysis, the District or contractors will select and implement measures to control contamination, with a performance standard that surface and groundwater quality will be returned to baseline conditions. These measures will be subject to approval by the District, DTSC, and the Regional Water Quality Control Board.
GEN-27	Existing Hazardous Sites	Upon selection of maintenance project locations, the District will conduct a search for existing known contaminated sites, as part of its annual preparation of the Notice of Proposed Work (NPW), on the State Water Resource Control Board's GeoTracker Web site (http://www.geotracker.waterboards.ca.gov). The Geotracker search will only be performed for the District's ground disturbing activities. For any proposed ground disturbing maintenance sites located within 1,500 feet of any "open" sites where contamination has not been remediated, the District will contact the RWQCB case manager listed in the database. The District will work with the case manager to ensure maintenance activities would not affect cleanup or monitoring activities or threaten the public or environment.
GEN-28	Fire Prevention	1. All earthmoving and portable equipment with internal combustion engines will be equipped with spark arrestors. 2. During the high fire danger period (April 1–December 1), work crews will ~~: a) H~~have appropriate fire suppression equipment available at the work site.
GEN-29	Dust Management	The District will implement the Bay Area Air Quality Management District's (BAAQMD) required Dust Control Measures (http://www.baaqmd.gov/~/media/Files/Planning%20and%20Research/CEQA/BAAQMD%20CEQA%20Guidelines%20May%202011.ashx?la=en). Current measures stipulated by the BAAQMD Guidelines include the following: 1. All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day. 2. All haul trucks transporting soil, sand, or other loose material off-site shall be covered. 3. All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited. 4. Water used to wash the various exposed surfaces (i.e., parking areas, staging areas, soil piles, graded areas, etc.) will not be allowed to enter the water way. 5. All vehicle speeds on unpaved roads shall be limited to 15 mph. 6. All roadways, driveways, and sidewalks to be paved shall be completed as soon as possible. Building pads shall be laid as soon as possible after grading unless seeding or soil binders are used. 7. Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of California Code of Regulations [CCR]). Clear signage shall be provided for construction workers at all access points. 8. All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified visible emissions evaluator. 9. Post a publicly visible sign with the telephone number and person to contact at the lead agency regarding dust complaints. This person shall respond and take corrective action within 48 hours. The Air District's phone number shall also be visible to ensure compliance with applicable regulations.

BMP Number	BMP Title	BMP Description
GEN-30	Vehicle and Equipment Maintenance	1. All vehicles and equipment will be kept clean. Excessive build-up of oil and grease will be prevented. 2. All equipment used in the creek channel will be inspected for leaks each day prior to initiation of work. Maintenance, repairs, or other necessary actions will be taken to prevent or repair leaks, prior to use. 3. Incoming vehicles and equipment (including delivery trucks, and employee and subcontractor vehicles) will be checked for leaking oil and fluids. Vehicles or equipment visibly leaking operational fluids will not be allowed on-site. 4. No heavy equipment will operate in a live stream. This will not apply to activities for which no other option exists, such as sediment removal which cannot be conducted from top of bank, etc. In these cases, dewatering will be conducted as necessary, following the protocols in BMPs GEN-33 or GEN-34. 5. No equipment servicing will be done in the creek channel or immediate floodplain, unless equipment stationed in these locations cannot be readily relocated (i.e., pumps and generators). 6. If emergency repairs are required in the field, only those repairs necessary to move equipment to a more secure location, and that can be performed without releasing any material into the floodway or water, will be conducted in the channel or floodplain. 7. If necessary, all servicing of equipment done at the job site will be conducted in a designated, protected area to reduce threats to water quality from vehicle fluid spills. Designated areas will not directly connect to the ground, surface water, or the storm drain system. The service area will be clearly designated with berms, sandbags, or other barriers. Secondary containment, such as a drain pan, to catch spills or leaks will be used when removing or changing fluids. Fluids will be stored in appropriate containers with covers, and properly recycled or disposed of offsite.
GEN-31	Vehicle Cleaning	1. Equipment will be cleaned of any visible sediment or vegetation clumps before transferring and using in a different watershed to avoid spreading pathogens or exotic/invasive species. 2. Vehicle and equipment washing can occur on-site only as needed to prevent the spread of sediment, pathogens or exotic/invasive species. No runoff from vehicle or equipment washing is allowed to enter water bodies, including creek channels and storm drains, without being subjected to adequate filtration (e.g., vegetated buffers, straw wattles or bales, fiber rolls, and silt screens). The discharge of decant water from any on-site wash area to water bodies or to areas outside of the active project site is prohibited. Additional vehicle/equipment washing will occur at the approved wash area in the District's corporation yard.
GEN-32	Vehicle and Equipment Fueling	1. No fueling will be done in the channel (top-of-bank to top-of-bank) or immediate floodplain unless equipment stationed in these locations cannot be readily relocated (e.g., pumps and generators). 2. All off-site fueling sites (i.e., on access roads above the top-of-bank) will be equipped with secondary containment and avoid a direct connection to soil, surface water, or the storm drainage system. 3. For stationary equipment that must be fueled on-site, secondary containment, such as a drain pan or drop cloth, will be used to prevent accidental spills of fuels from reaching the soil, surface water, or the storm drain system.

BMP Number	BMP Title	BMP Description
Dewatering		
GEN-33	Dewatering for Non-Tidal Sites	When sediment removal and bank stabilization work area includes a flowing stream, the entire streamflow will be diverted around the work area by construction of a temporary dam and/or bypass. Where appropriate, stream flow diversions will occur via gravity driven systems. *A. Planning to avoid and minimize impacts to water quality and aquatic wildlife:* 1. For construction and monitoring of a stream flow bypass, the *Sediment Removal and Bank Stabilization Projects* checklist will be completed. 2. Recommendations by a qualified Fisheries Biologist to protect native fisheries and aquatic vertebrates will be incorporated into the bypass design. The recommendations may include but are not limited to: i. Screening the stream flow diversion source or pump to prevent entrainment of native fish or amphibian species. The screening dimensions will be appropriate to the species present. ii. Relocation of native aquatic vertebrates. This will include the methods to be used to capture and hold and move the aquatic vertebrates and a description of where the aquatic vertebrates will be relocated. 3. Depending on the channel configurations, sediment removal activities may occur where the flows are not bypassed around the work site as long as a berm is left between the work area and stream flows to minimize water quality impacts during excavation activities. The berm between the work and the live channel will be wide enough to prevent introduction of turbid water from the cell into the live channel. *B. Construction*: 1. The construction of facilities will be based on the water bypass plan. 2. Coffer dams will be installed both upstream and downstream of the work area to minimize impacts or the distance necessary to accomplish effective passive systems. 3. In streams where water may enter the construction site from downstream (reverse flow) additional coffer dams (downstream) may be necessary. When multiple coffer dams are constructed, the upstream dam will be constructed first. 4. ~~5.~~ Instream cofferdams will only be built from materials such as sandbags, earth fill, clean gravel, or rubber bladders which will cause little or no siltation or turbidity. 5. ~~4.~~ Plastic sheeting will be placed over k-rails, timbers, and earth fill to minimize water seepage into and out of the maintenance areas. The plastic sheets will be firmly anchored, using sandbags, to the streambed to minimize water seepage. 6. When pumping is necessary to dewater a work site, a temporary siltation basin and/or use of silt bags may be required to prevent sediment from re-entering the wetted channel. Pump intakes will be screened to prevent harm to aquatic wildlife. 7. If necessary to prevent erosion an energy dissipater will be constructed at the discharge point. 8. Timing of flow diversions will be coordinated with the completion of the dam structure to facilitate not drying up the downstream creek area and to minimize dry back conditions.

BMP Number	BMP Title	BMP Description
		C. Implementation: 1. Water flows downstream of the project site will be maintained to prevent stranding aquatic vertebrates. 2. Water diverted around work sites and water detained by coffer dams will be protected from maintenance activity-related pollutants, such as soils, equipment lubricants or fuels. 3. The *Fish Relocation Guidelines* will be implemented to ensure that fish and other aquatic vertebrates are not stranded during construction and implementation of channel dewatering. a) Native aquatic vertebrates shall be captured in the work area and transferred to another reach as determined by a qualified biologist. Timing of work in streams that supports a significant number of amphibians will be delayed until metamorphosis occurs to minimize impacts to the resource. Capture and relocation of aquatic native vertebrates is not required at individual work sites when site conditions preclude reasonably effective operation of capture gear and equipment. b) Aquatic invertebrates will not be transferred (other than incidental catches) because of their anticipated abundance and colonization after completion of the repair work. 4. Filtration devices (silt bags attached to the end of discharge hoses and pipes to remove sediment from discharged water) or settling basins will be provided as necessary at discharge sites to ensure that the turbidity of discharged water is not visibly more turbid than the water in the channel upstream of the maintenance site. If increases in turbidity are observed, additional measures will be implemented such as a larger settling basin or additional filtration. If increases in turbidity persist, the District's Stream Maintenance Program Implementation Project Manager will be alerted since turbidity measurements may be required. 5. Water remaining in the work area will be removed by evaporation, seepage, or pumping. When pumping is required to dewater a site, the decanted water will be discharged with water bypassed around the site or in a separate erosion control – energy dissipation area/vegetated swale. The turbidity of discharged water will not be visibly more turbid than the receiving water. *Deconstruction*: 1. When maintenance is completed, the flow diversion structure will be removed as soon as possible. Impounded water will be released at a reduced velocity to minimize erosion, turbidity, or harm to downstream habitat. 2. Removal will normally proceed from downstream in an upstream direction. 3. When diversion structures are removed, the ponded water will be directed back into the low-flow channel in a phased manner to minimize erosion and downstream water quality impacts. Normal flows will be restored. 4. The area disturbed by flow bypass mechanisms will be restored to the pre-project condition at the completion of the project (to the extent practical). This may include, but is not limited to, recontouring the area and planting of riparian vegetation.

BMP Number	BMP Title	BMP Description
GEN-34	Dewatering in Tidal Work Areas	For tidal areas, a downstream cofferdam will be constructed to prevent the work area from being inundated by tidal flows. 1. Installation of cofferdams and fish exclusion measures will be installed at low tide when the channel and project site are at their driest. 2. It is preferable to not use any bypass pipes when work is being conducted on one side of the channel, if~~s~~ isolated by the cofferdam, and flows can continue on the other side of the creek channel without entering the project area. 3. If downstream flows cannot be diverted around the project site, the creek waters will be transmitted around the site through cofferdam bypass pipes. Waters discharged through tidal cofferdam bypass pipes will not exceed 50 NTUs over the background levels of the tidal waters into which they are discharged. 4. Cofferdams in tidal areas may be made from earthen or gravel material. If earth is used, the downstream and upstream faces will be covered by a protected covering (e.g., plastic or fabric) if needed to minimize erosion. A protected covering or sheeting will be placed on the water side of an earthen coffer dam to protect water quality. 5. When maintenance is completed, the cofferdams and bypass pipes will be removed as soon as possible but no more than 72 hours after work is completed. Flows will be restored at a reduced velocity to minimize erosion, turbidity, or harm to downstream habitat.
GEN-35	Pump/Generator Operations and Maintenance	When needed to assist in channel dewatering, pumps and generators will be maintained and operated in a manner that minimizes impacts to water quality and aquatic species. 1. Pumps and generators will be maintained according to manufacturers' specifications to regulate flows to prevent dryback or washout conditions. 2. Pumps will be operated and monitored to prevent low water conditions, which could pump muddy bottom water, or high water conditions, which creates ponding. 3. All pump intakes will be screened. Pumps in steelhead creeks will be screened according to NMFS criteria (http://www.swr.noaa.gov/sr/fishscrn.pdf) to prevent entrainment of steelhead.
Public Safety		
GEN-36	Public Outreach	The public will be informed of stream maintenance work prior to the start of work as part of the preparation of the NPW for all projects in the NPW: 1. Each spring, a newspaper notice will be published with information on the NPW work sites, approximate work dates, and contact information. 2. Neighborhood Work Notices will be distributed as part of the NPW preparation prior to the start of work. 3. Local governments (cities and County) will be notified of scheduled maintenance work. The ~~annual work plan~~ NPW will be submitted to the public works departments, local fire districts, and the District's ~~Zone Advisory Committee~~Flood Protection and Watershed Advisory Committees. 4. The District will post specific information on individual maintenance projects on the Stream Maintenance Web site: (http://valleywater.org/EkContent.aspx?id=379&terms=stream+maintenance) 5. For high profile projects, at the District's discretion, signs will be posted in the neighborhood to notify the public at least one week in advance of maintenance schedules, trail closures, and road/lane closures as necessary and as possible. Signage used at work sites will include contact information for lodging comments and/or complaints regarding the maintenance activities.

BMP Number	BMP Title	BMP Description
GEN-37	Implement Public Safety Measures	The District will implement public safety measures during maintenance as follows: 1. Construction signs will be posted at job sites warning the public of construction work and to exercise caution, as appropriate to public accessed areas. 2. Where work is proposed adjacent to a recreational trail, warning signs will be posted several feet beyond the limits of work. Signs will also be posted if trails will be temporarily closed. 3. If needed, a lane will be temporarily closed to allow for trucks to pull into and out of access points to the work site. 4. Temporary fencing, either the orange safety type or chain link, will be installed above repair sites on bank stabilization projects. 5. When necessary, District or contracted staff will provide traffic control and site security.
GEN-38	Minimize Noise Disturbances to Residential Areas	The District will implement maintenance practices that minimize disturbances to residential areas surrounding work sites. 1. With the exception of emergencies, work will be conducted during normal working hours. Maintenance activities in residential areas will not occur on Saturdays, Sundays, or District observed holidays except during emergencies, or with approval by the local jurisdiction and advance notification of surrounding residents. 2. Vehicles, generators and heavy equipment will be equipped with adequate mufflers. 3. Idling of vehicles will be prohibited beyond 5 minutes unless operation of the engine is required to operate a necessary system such as a power take-off (PTO).
GEN-39	Planning for Pedestrians, Traffic Flow, and Safety Measures	1. Work will be staged and conducted in a manner that maintains two-way traffic flow on public roadways in the vicinity of the work site. If temporary lane closures are necessary, they will be coordinated with the appropriate jurisdictional agency and scheduled to occur outside of peak traffic hours (7:00 – 10:00 a.m. and 3:00 – 6:00 p.m.) to the maximum extent practicable. Any lane closures will include advance warning signage, a detour route and flaggers in both directions. When work is conducted on public roads and may have the potential to affect traffic flow, work will be coordinated with local emergency service providers as necessary to ensure that emergency vehicle access and response is not impeded. 2. Bicycle and pedestrian facility closures will be scheduled outside of peak traffic hours (7:00 – 10:00 a.m. and 3:00 – 6:00 p.m.) to the maximum extent practicable. 3. Public transit access and routes will be maintained in the vicinity of the work site. If public transit will be affected by temporary road closures and require detours, affected transit authorities will be consulted and kept informed of project activities. 4. Adequate parking will be provided or designated public parking areas will be used for maintenance-related vehicles not in use through the maintenance period. 5. Access to driveways and private roads will be maintained. If brief periods of maintenance would temporarily block access, property owners will be notified prior to maintenance activities.

BMP Number	BMP Title	BMP Description
Cultural Resources		
GEN-40	Discovery of Cultural Remains or Historic or Paleontological Artifacts	Work in areas where remains or artifacts are found will be restricted or stopped until proper protocols are met. 1. Work at the location of the find will halt immediately within 50 feet of the find. A “no work” zone shall be established utilizing appropriate flagging to delineate the boundary of this zone, which shall measure at least 50 feet in all directions from the find. 2. The District shall retain the services of a Consulting Archaeologist or Paleontologist, who shall visit the discovery site as soon as practicable, and perform minor hand-excavation to describe the archaeological or paleontological resources present and assess the amount of disturbance. 3. The Consulting Archaeologist shall provide to the District and the Corps, at a minimum, written and digital-photographic documentation of all observed materials, utilizing the guidelines for evaluating archaeological resources for the California Register of Historic Places (CRHP) and National Register of Historic Places (NRHP). Based on the assessment, the District and Corps shall identify the CEQA and Section 106 cultural-resources compliance procedure to be implemented. 4. If the find appears to not meet the CRHP or NRHP criteria of significance, and the Corps archaeologist concurs with the Consulting Archaeologist’s conclusions, construction shall continue while monitored by the Consulting Archaeologist. The authorized maintenance work shall resume at the discovery site only after the District has retained a Consulting Archaeologist to monitor and the Watershed Manager has received notification from the Corps to continue work. 5. If the find appears significant, avoidance of additional impacts is the preferred alternative. The Consulting Archaeologist shall determine if adverse impacts to the resources can be avoided. 6. When avoidance is not practical (e.g., maintenance activities cannot be deferred or they must be completed to satisfy the SMP objective), the District shall develop an Action Plan and submit it to the Corps within 48 hours of Consulting Archaeologist’s evaluation of the discovery. The action Plan may be submitted via e-mail to ~~(~~rstradford@spd.usace.army.mil~~)~~. The Action Plan is synonymous with a data-recovery plan. It shall be prepared in accordance with the current professional standards and State guidelines for reporting the results of the work, and shall describe the services of a Native American Consultant and a proposal for curation of cultural materials recovered from a non-grave context. 7. The recovery effort will be detailed in a report prepared by the archaeologist in accordance with current archaeological standards. Any non-grave artifacts will be placed with an appropriate repository. 8. The Consulting Paleontologist will meet the Society for Vertebrate Paleontology’s criteria for a “qualified professional paleontologist” (Society of Vertebrate Paleontology Conformable Impact Mitigation Guidelines Committee 1995). 9. The paleontologist will follow the Society for Vertebrate Paleontology’s guidelines for treatment of the artifact. Treatment may include preparation and recovery of fossil materials for an appropriate museum or university collection, and may include preparation of a report describing the finds. The District will be responsible for ensuring that paleontologist’s recommendations are implemented. 10. In the event of discovery of human remains (or the find consists of bones suspected to be human), the field crew supervisor shall take immediate steps to secure and protect such remains from vandalism during periods when work crews are absent.) 11. Immediately notify the Santa Clara County Coroner and provide any information that identify the remains as

BMP Number	BMP Title	BMP Description
		Native American. If the remains are determined to be from a prehistoric Native American, or determined to be a Native American from the ethnographic period, the Coroner shall contact the Native American Heritage Commission (NAHC) within 24 hours of being notified of the remains. The NAHC then designates and notifies within 24 hours a Most Likely Descendant (MLD). The MLD has 24 hours to consult and provide recommendations for the treatment or disposition, with proper dignity, of the human remains and grave goods. 12. Preservation in situ is the preferred option. Human remains shall be preserved in situ if continuation of the maintenance work, as determined by the Consulting Archaeologist and MLD, will not cause further damage to the remains. The remains and artifacts shall be documented and the find location carefully backfilled (with protective geo-fabric if desirable) and recorded in District project files. 13. Human remains or cultural items exposed during maintenance that cannot be protected from further damage shall be exhumed by the Consulting Archaeologist at the discretion of the MLD and reburied with the concurrence of the MLD in a place mutually agreed upon by all parties.
GEN-41	Review of Projects with Native Soil	A cultural resources specialist will conduct a review and evaluation of those sites that would involve disturbance / excavation of native soil previously undisturbed by contemporary human activities to determine their potential for affecting significant cultural resources. The evaluation of the potential to disturb cultural resources will be based on an initial review of archival information provided by the California Historical Resources System/Northwest Information Center (CHRIS/NWIC) in regard to the project area based on a 0.25 mile search radius. It is recommended that this initial archival review be completed by a professional archaeologist who will be able to view confidential site location data and literature to arrive at a preliminary sensitivity determination. If necessary, a further archival record search and literature review (including a review of the Sacred Lands Inventory of the Native American Heritage Commission); and a field inventory of the project area will be conducted to determine the presence/absence of surface cultural materials associated with either prehistoric or historic occupation. The results along with any mitigation and/or management recommendations would be presented in an appropriate report format and include any necessary maps, figures, and correspondence with interested parties. A summary table indicating appropriate management actions (e.g., monitoring during construction, presence/absence testing for subsurface resources; data recovery, etc.) will be developed for each project site reviewed. The management actions will be implemented on site to avoid significant effects to cultural resources.

BMP Number	BMP Title	BMP Description
Utilities		
GEN-42	Investigation of Utility Line Locations	An evaluation of the locations of utility lines that could be affected by maintenance activities will be conducted annually as part of the preparation of the Notice of Proposed Work (NPW). Utilities will be avoided as much as possible. For maintenance areas with the potential for adverse effects on utility services, the following measures shall be implemented: 1. Utility excavation or encroachment permits shall be required from the appropriate agencies. These permits include measures to minimize utility disruption. The District and its contractors shall comply with permit conditions. Such conditions shall be included in construction contract specifications. 2. Utility locations shall be verified through a field survey (potholing) and use of the Underground Service Alert services. 3. Detailed specifications shall be prepared as part of the design plans to include procedures for the excavation, support, and/or fill of areas around utility cables and pipelines. All affected utility services shall be notified of the District's maintenance plans and schedule. Arrangements shall be made with these entities regarding protection, relocation, or temporary disconnection of services. 4. Residents and businesses in the project area shall be notified of planned utility service disruption 2 to 4 days in advance, in conformance with state standards. 5. Disconnected cables and lines shall be reconnected promptly.

SECTION C – Sediment Removal BMPs

This group of BMPs is intended to be implemented specifically during sediment removal activities~~. T~~to avoid potential impacts on biological resources~~, none of these measures will be implemented until authorization from the SMP Implementation Project Manager is received~~.

BMP Number	BMP Title	BMP Description
SED-1	Groundwater Management	If high levels of groundwater (i.e., visible water) are encountered during excavations in a work area, the water will be pumped out of the work site or left within the work area if the work activity is not causing water quality degradation in a live stream. Water Quality monitoring would need to occur. If necessary to protect water quality, the extracted water will be discharged into specifically constructed infiltration basins, holding ponds, or areas with vegetation to remove sediment prior to the water re-entering a creek. Water discharged into vegetated areas or swales will be pumped in a manner that will not create erosion around vegetation.
SED-2	Prevent Scour Downstream of Sediment Removal	Sediment removal sites in the transport zone on alluvial fans may cause increased scour downstream if they experience scouring flows or rapid sediment accumulation after maintenance. After sediment removal, the channel will be graded so that the transition between the existing channel both upstream and downstream of the maintenance area is smooth and continuous between the maintained and non-maintained areas and does not present a sudden vertical transition (wall of sediment) or other blockage that could erode once flows are restored to the channel.

BMP Number	BMP Title	BMP Description
SED-3	Restore Channel Features	Low-flow channels within non-tidal streams will be contoured to facilitate fish passage and will emulate the pre-construction conditions as closely as possible, within the finished channel topography.
SED-4	Berm Bypass	Where sediment removal is accomplished without a bypass by removing alternating cells, the berm between the work and the live channel will be wide enough to prevent introduction of turbid water from the cell into the live channel.

SECTION D – Vegetation Management BMPs

These BMPs provide specific and detailed guidance on the variety of vegetation management procedures implemented by the District. BMPs for the following maintenance techniques are included: tree pruning, tree removal, plant removal, woody debris management, herbicide application, mowing, discing, flaming, and grazing. Practices will be implemented by fully trained and qualified field crews.

BMP Number	BMP Title	BMP Description
VEG-1	Minimize Local Erosion Increase from In-channel Vegetation Removal	To minimize the potential effect of localized erosion, the toe of the bank will be protected by leaving vegetation to the maximum extent possible and consistent with the maintenance guidelines or original design requirements.
VEG-2	Non-native Invasive Plant Removal	Invasive species (e.g. cape ivy [*Delairea odorata/Senecio mikanoides]*, arundo [*Arundo donax*]) will be disposed of in a manner that will not contribute to the further spread of the species. Cape ivy removed during a project shall be bagged and disposed of in a landfill. Arundo canes will be prevented from floating downstream or otherwise entering the creek or waterway.
VEG-3	Use Appropriate Equipment for Instream Removal	When using heavy equipment to cut or remove instream vegetation, low ground pressure equipment, such as tracked wheels will be utilized to reduce impacts to the streambed.
VEG-4	Use Flamers with Caution	1. A fire extinguisher, water supply and other appropriate fire suppression equipment will always be kept close to the work site in case of an emergency. 2. Propane tanks will be checked for leaks and proper functioning prior to and proceeding use of flaming equipment. The propane tank will be treated as a hazardous material.
VEG-5	Conduct Flaming During Appropriate Weather and Seasonal Conditions	Flamers will not be used during periods of high fire danger or in areas where fuel or climate conditions could accidentally ignite a fire.
VEG-6	Standard Grazing Procedures	1. Vegetation and areas to be preserved will be fenced off to exclude grazing animals. 2. Grazing animals will be excluded from stream channels, using fencing or other barriers.

SECTION E – Bank Stabilization BMPs

These BMPs provide additional guidance during implementation of bank stabilization projects, ~~. T~~to avoid impacts on biological and cultural resources~~, none of these measures will be implemented until authorization from the SMP Implementation Project Manager is received~~. Review of the Post-Project Restoration BMPs in Section F is recommended because those measures will be implemented after bank stabilization projects are complete. The BMPs included in this section are implemented by the field crew and site manager.

BMP Number	BMP Title	BMP Description
BANK-1	Bank Stabilization Design to Prevent Erosion Downstream	To further prevent potential downstream erosion impacts due to bank stabilization, the site design will be adjusted to provide proactive protection of vulnerable areas within the reach of the worksite. Such measures include, but are not limited to, appropriately keyed-in coir logs, riparian planting, strategic placement of rock, and flow deflectors. Bank stabilization will include appropriate transition designs upstream and downstream of the work site to prevent potential erosion impacts.
BANK-2	Concrete Use Near Waterways	Concrete that has not been cured is alkaline and can increase the pH of the water. ~~; f~~Fresh concrete will be isolated until it no longer poses a threat to water quality using the following appropriate measures: 1. Wet sacked concrete will be excluded from the wetted channel for a period of two weeks after installation. During that time, the wet sacked concrete will be kept moist (such as covering with wet carpet) and runoff from the wet sacked concrete will not be allowed to enter a live stream. 2. Poured concrete will be excluded from the wetted channel for a period of two weeks after it is poured. During that time, the poured concrete will be kept moist, and runoff from the wet concrete will not be allowed to enter a live stream. Commercial sealants (e.g., Deep Seal, Elasto-Deck Reservoir Grade) may be applied to the poured concrete surface where difficulty in excluding water flow for a long period may occur. If a sealant is used, water will be excluded from the site until the sealant is dry. 3. Dry sacked concrete will not be used in any channel. 4. An area outside of the channel and floodplain will be designated to clean out concrete transit vehicles.
BANK-3	Bank Stabilization Post-Construction Maintenance	The District may maintain or repair bank stabilization projects that are less than 2 years old that are damaged by winter flows. The District will notify the regulatory agencies 24 hours prior to beginning the work and the work will be reported as part of the Post-Construction Report submitted by January 15 of each year or if necessary, the subsequent year. Appropriate BMPs will be applied during maintenance repairs.

SECTION F – Post-Project Restoration BMPs

These BMPs will be implemented, as appropriate, on all sites that involve ground disturbance.

BMP Number	BMP Title	BMP Description
REVEG-1	Seeding	Sites where maintenance activities result in exposed soil will be stabilized to prevent erosion. Disturbed areas shall be seeded with native seed as soon as is appropriate after maintenance activities are complete. An erosion control seed mix may be applied to exposed soils, and down to the ordinary high water mark (OHWM). 1. The seed mix should consist of California native grasses (e.g., *Hordeum brachyantherum*, *Elymus glaucus*, and *Vulpia microstachyes*) or annual, sterile seed mix. 2. Temporary earthen access roads may be seeded when site and horticultural conditions are suitable, or have other appropriate erosion control measures in place (GEN-20).
REVEG-2	Planting Material	Revegetation and replacement plantings will consist of locally collected native species. Species selection will be based on surveys of natural areas on the same creek that have a similar ecological setting and/or as appropriate for the site location.

SECTION G – Management of Animal ~~Damage~~ Conflict BMPs

Methods of animal management included in the SMP are avoidance, biological controls, physical alterations, habitat alterations, and lethal controls. Of all these methods, implementation of lethal controls has the highest potential for environmental and biological impacts. Therefore, the animal management BMPs provided in this section focus on lethal controls. The application area for lethal controls will be identified during the annual planning process (see the Biological Resource Planning BMPs) and guided as directed by wildlife biologists. Species habitat areas are defined by the District's GIS species mapping, updated CNDDB and known local biological information and are included in the SMP Update Subsequent EIR.

BMP Number	BMP Title	BMP Description
ANI-1	Avoid Redistribution of Rodenticides	Carcass surveys will be conducted periodically when acute poisons and first generation anticoagulants are used. The frequency of the carcass surveys will be specific to the type of rodenticide used ~~In areas where rodenticides are used, carcass retrieval surveys will be conducted~~ as follows to minimize secondary poisoning impacts~~:~~ • Acute toxins-Daily, carcass surveys, beginning the first day after application until the end of the baiting period for acute toxins used above-ground . • Anticoagulants-~~Weekly for anticoagulants~~Within 7 days of installation of first generation anticoagulant bait, and weekly thereafter. Anytime a carcass is found, daily carcass surveys will begin for as long as carcasses are found until no carcasses are found during a daily survey. Once no carcasses are found, carcass surveys will return to the weekly carcass survey timeline maximum from the date of initial installation of an anticoagulant bait station. ~~. In addition, twice per year District biologists will conduct daily carcass surveys for a full cycle of a baiting trap.~~

BMP Number	BMP Title	BMP Description
		~~to minimize secondary poisoning impacts.~~ To verify that the frequency of carcass surveys is adequate, a biologist will conduct daily carcass surveys 2 times per year over one baiting cycle. Based on the results of these surveys, the timing of carcass surveys will be adjusted if necessary. Any spilled bait will be cleaned up immediately.
ANI-2	Prevent Harm to the Salt Marsh Harvest Mouse and California Clapper Rail	1. No rodenticides or fumigants will be used within the range of the SMHM or CCR as identified on District range maps. 2. Methods of rodent control within SMHM or CCR habitat will be limited to live trapping. All live traps shall have openings measuring no smaller than 2 inches by 1 inch to allow any SMHM that inadvertently enter the trap to easily escape. All traps will be placed outside of pickleweed areas and above the high tide line.
ANI-3	Burrowing Owl, Bald Eagle and Golden Eagle Buffer Zone	Per the California Department of Fish and Game's 2008 *Guidance for Burrowing Owl Conservation*, a 656-yard buffer will be established around known burrowing owl locations where no rodenticides or fumigants (including smoke bombs) will be used. A 0.5-mile buffer will be established around known bald eagle and golden eagle nesting locations where no rodenticides will be used.
ANI-4	Animal Control in Sensitive Amphibian Habitat	1. Fumigants will not be used within the habitat areas of special status amphibians. 2. The use of bait stations within the potential habitat areas of California red-legged frog, California tiger salamander, or foothill yellow-legged frog will be limited to bait stations specifically designed to prevent entry by these species. 3. Any live traps will allow California red-legged frogs, California tiger salamanders, or foothill yellow-legged frogs to safely exit (e.g., by having openings measuring no smaller than 2 inches by 1 inch).
ANI-5	Slurry Mixture near Waterways	All slurry type mixes used to fill rodent burrows will be prevented from entering any waterway by using appropriate erosion control methods and according to the manufacturer's specifications. If the creek bed is dry or has been dewatered, any material that has entered the channel will be removed.

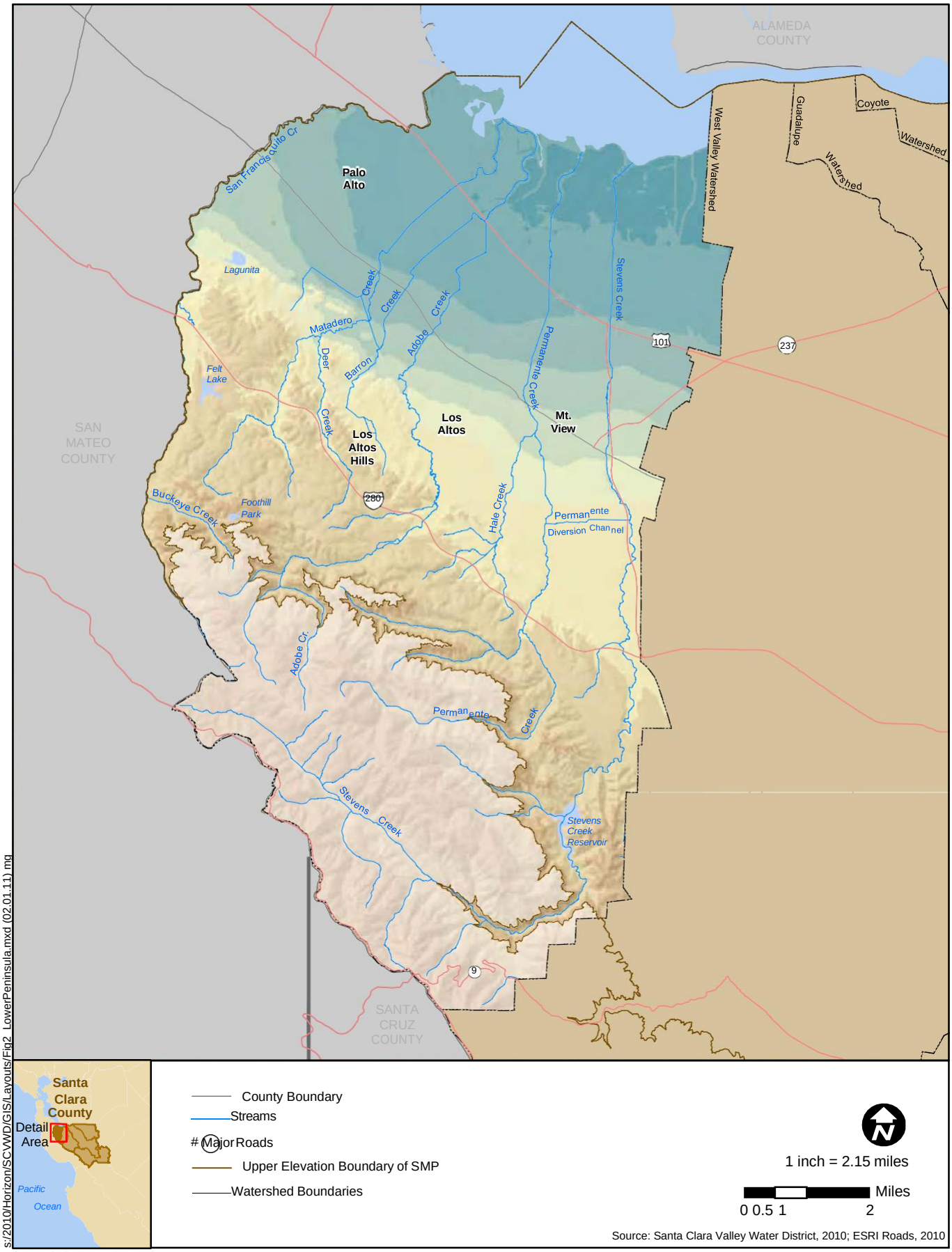
SECTION H – Use of Pesticides

Pesticides may be used for vegetation management or control of animal damage

BMP Number	BMP Title	BMP Description
HM-4	Posting and Notification for Pesticide Use	Posting of areas where pesticides are used will be performed in compliance with District Policy Ad-8.2 Pesticide Use as follows: 1. Posting will be performed in compliance with the label requirements of the product being applied. 2. In addition, posting will be provided for any products applied in areas used by the public for recreational purposes, or those areas readily accessible to the public, regardless of whether the label requires such notification. In doing this, the District ensures that exposure risk is minimized further by adopting practices that go beyond the product label requirements. (The posting method may be modified to avoid destruction of bait stations or scattering of rodenticide.)

BMP Number	BMP Title	BMP Description
		3. These postings will notify staff and the general public of the date and time of application, the product's active ingredients, and common name, and the time of allowable re-entry into the treated area. 4. Signs will not be removed until after the end of the specified re-entry interval. 5. Right-to-know literature on the product will be made available to anyone in the area during the re-entry period. 6. A District staff contact phone number will be posted on the sign, including a ~~pager~~cellular phone number. 7. Notification of pesticide activities will be made as required by law. Also, the District will maintain records of neighbors with specific needs relative to notification before treatment of an adjacent area so that such needs are met.

Source: Data compiled by Horizon Water and Environment in 2011



Source: Santa Clara Valley Water District, 2010; ESRI Roads, 2010

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Horizon WATER and ENVIRONMENT

Figure 2-2: Project Area
Lower Peninsula Watershed

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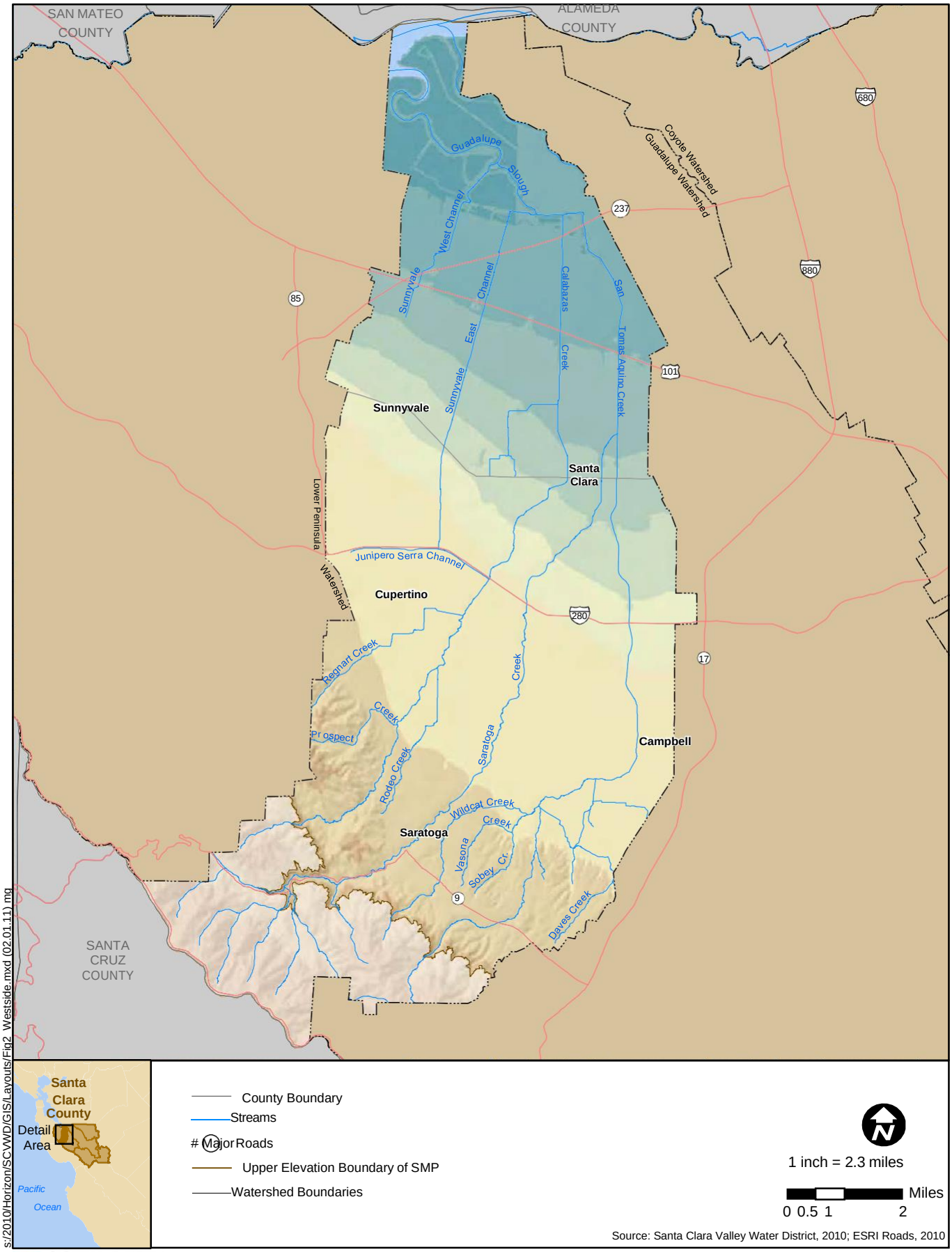

Horizon WATER and ENVIRONMENT

Figure 2-3: Project Area West Valley Watershed

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Source: Santa Clara Valley Water District, 2010; ESRI Roads, 2010

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Horizon WATER and ENVIRONMENT

Figure 2-4: Project Area Guadalupe Watershed

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Santa Clara County
Detail Area
Pacific Ocean

County Boundary
Streams
Major Roads
Upper Elevation Boundary of SMP
Watershed Boundaries

1 inch = 5 miles

Miles
0 1.25 2.5 5

Source: Santa Clara Valley Water District, 2010; ESRI Roads, 2010

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Horizon WATER and ENVIRONMENT

Figure 2-5: Project Area Coyote Watershed

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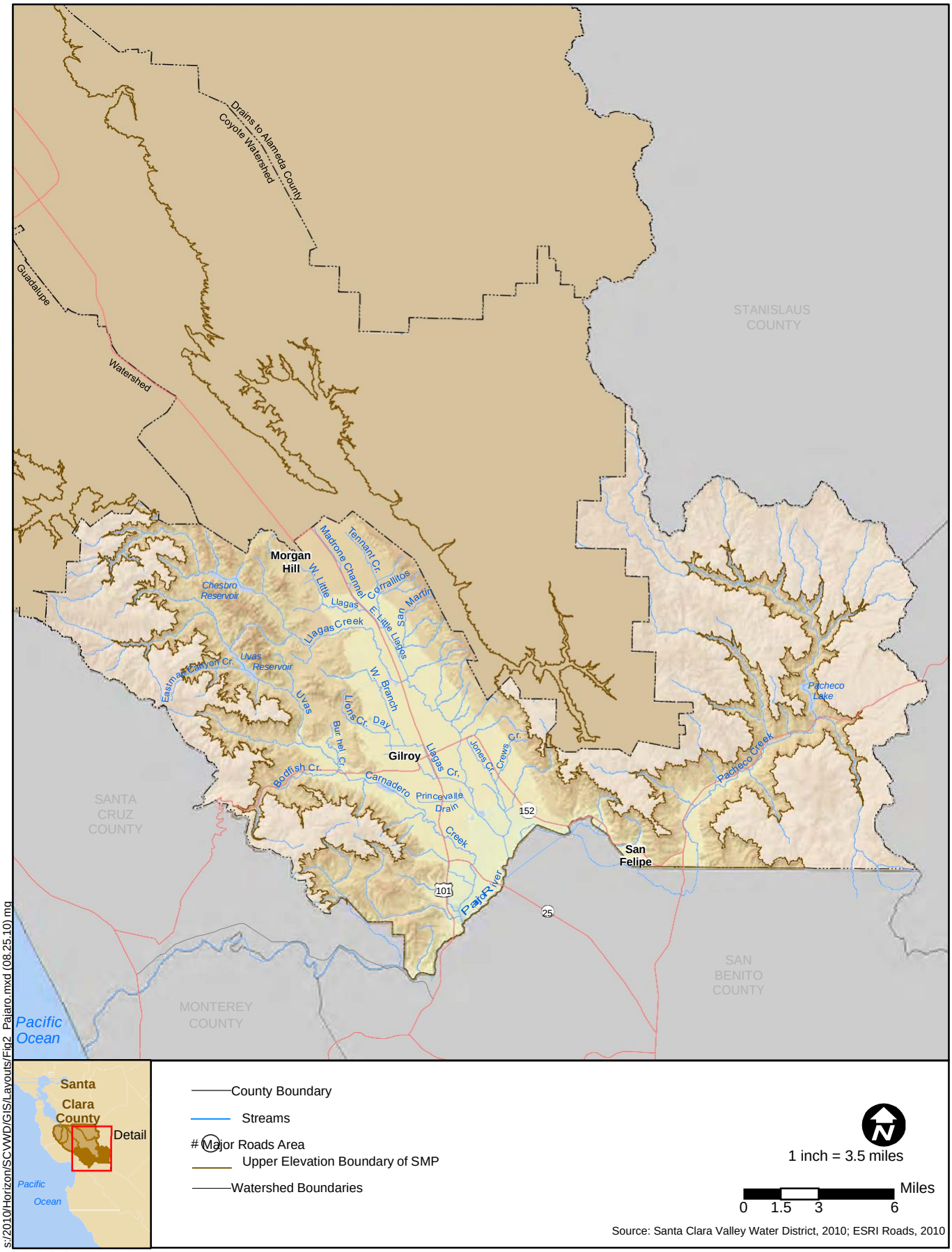

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Horizon WATER and ENVIRONMENT

Figure 2-6: Project Area Pajaro Watershed

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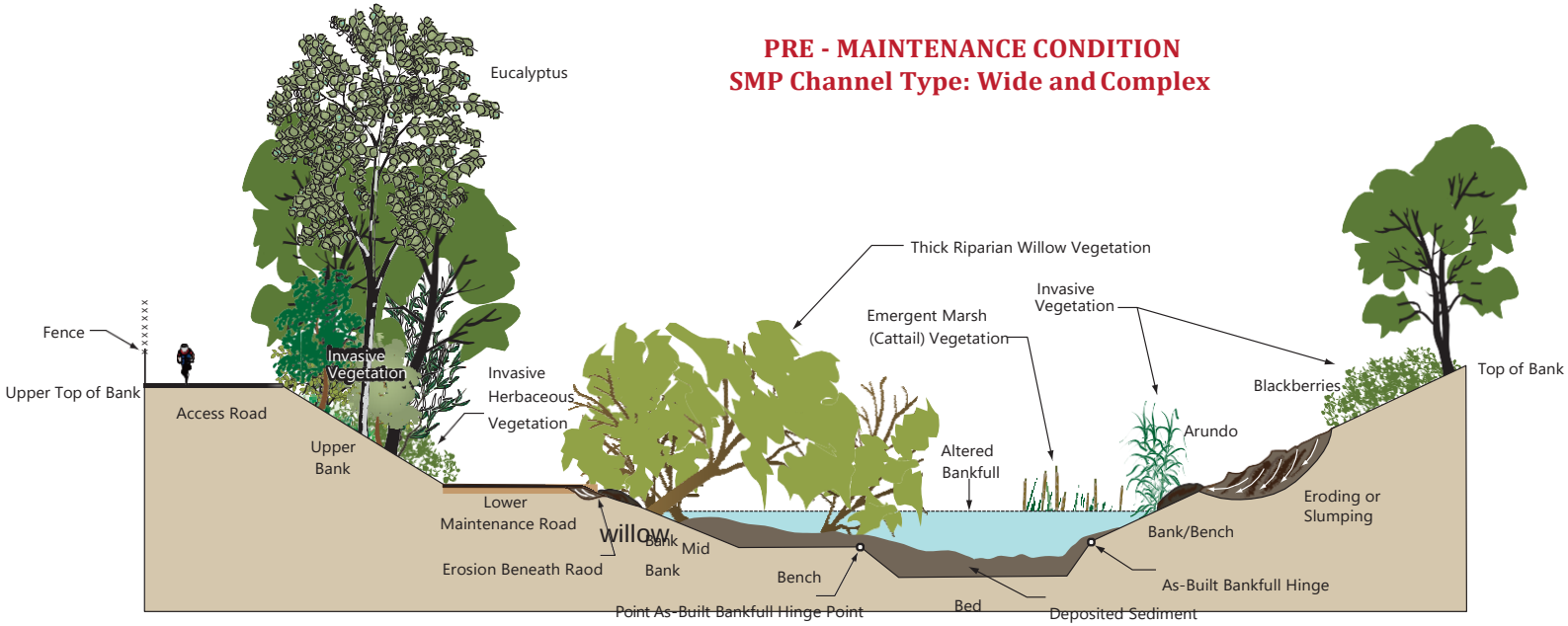

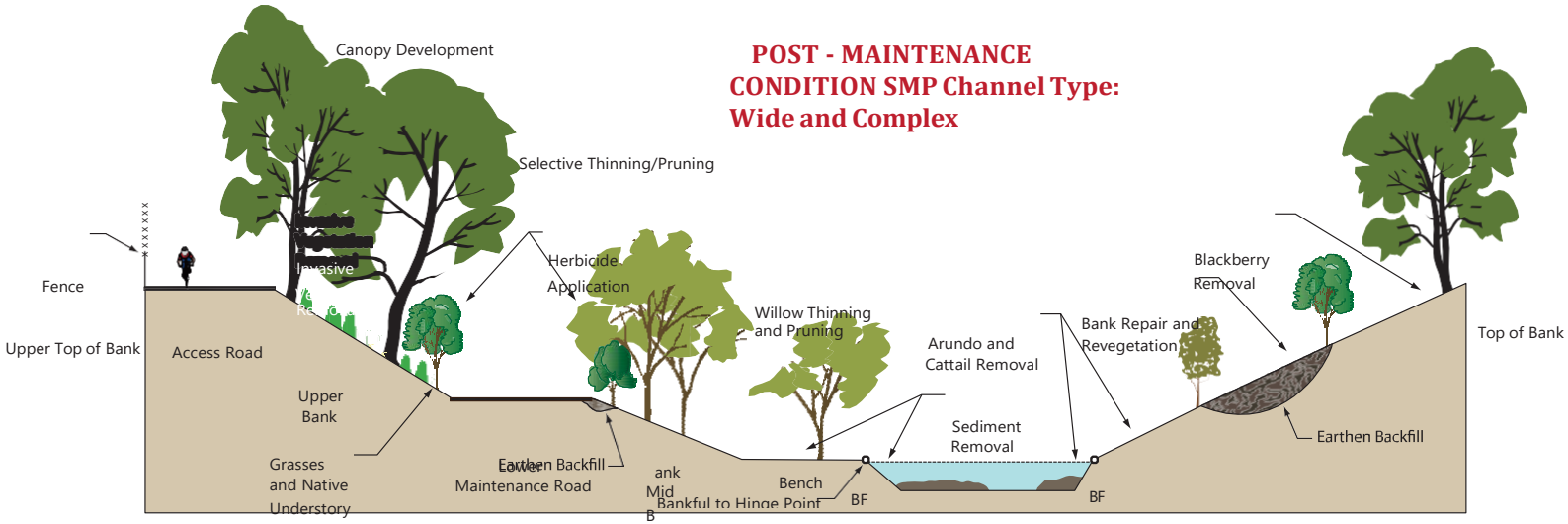

Note 1
- for flood control channels that include engineered levees, the upper bank portion of this typical cross section is analogous to the inboard levee. Many
- the areas in the typical cross-section identified as "bank" or "bench" are typically combined into a single geographic area type "bank/bench" for the purposes of
visible outboard slope that slopes outside and away from the channel to the adjacent land.

Horizon WATER and ENVIRONMENT

Figure 2)7
Example of SCVWD)Maintained Channel

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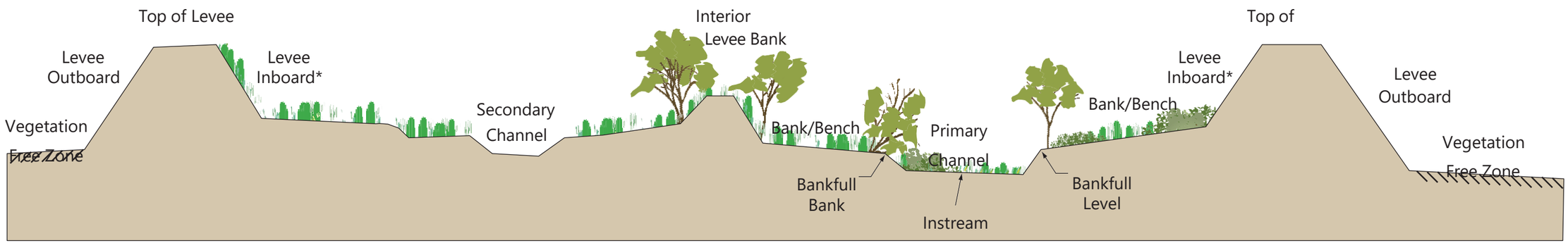

*Although in some instances vegetation exists at levee inboard locations, the local sponsor (and therefore responsible for maintenance), the U.S. Army Corps of Engineers (Corps) has indicated that vegetation-free zones should exist at levee inboard locations to maximize accessibility for inspection and maintenance (unless the local sponsor applies for and receives a vegetation variance from the Corps).

Horizon WATER and ENVIRONMENT

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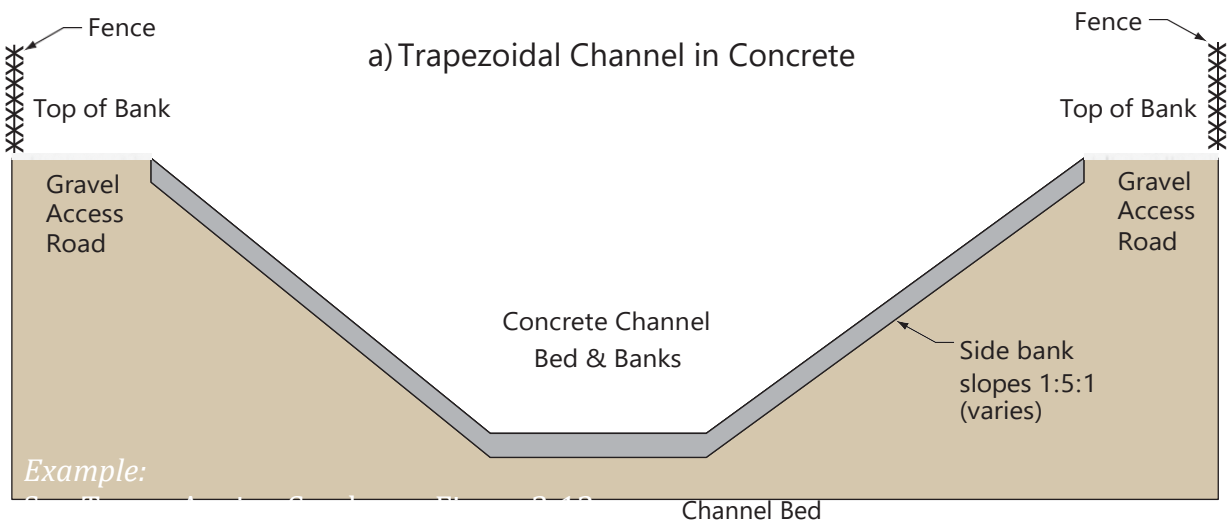
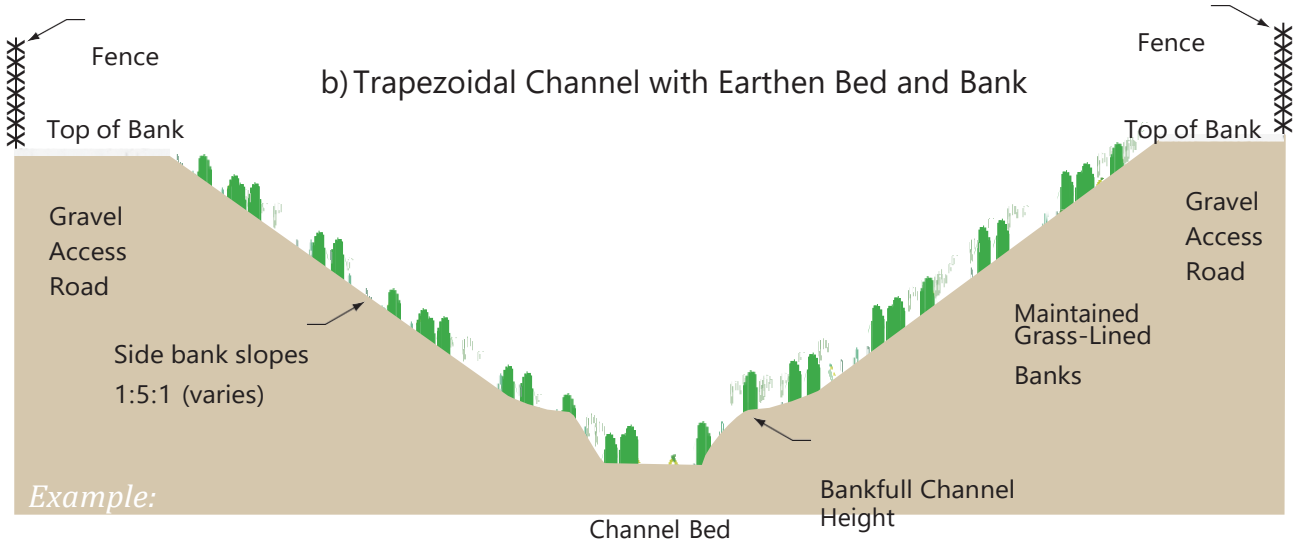
Typical Wide Channel Cross Section with Secondary Channel





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Horizon WATER and ENVIRONMENT

Figure 2)11
Typical Trapezoidal Channels

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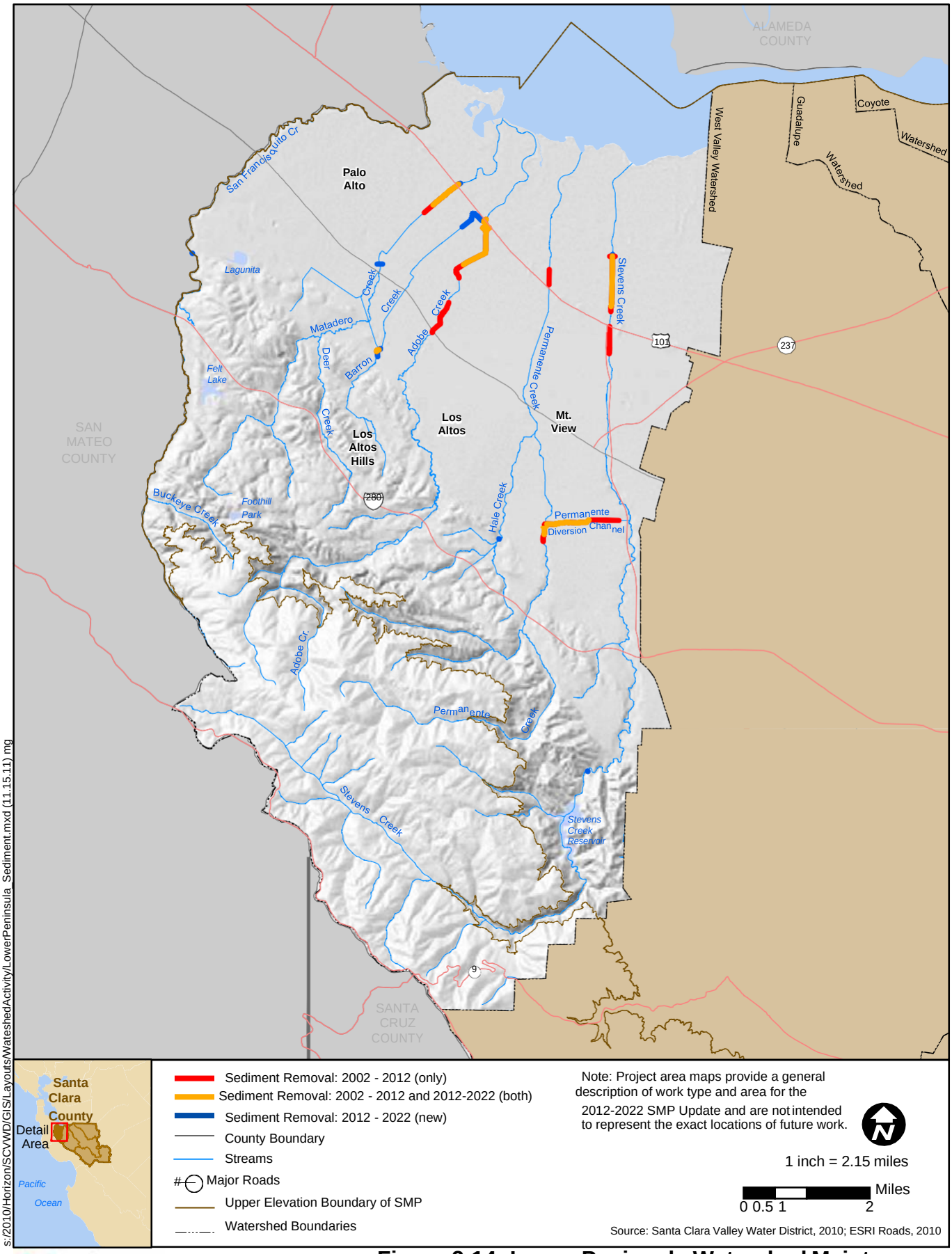

s:/2010/Horizon/SCVWD/GIS/Layouts/WatershedActivity/LowerPeninsula_Sediment.mxd (11.15.11) mg

Horizon WATER and ENVIRONMENT

Figure 2-14: Lower Peninsula Watershed Maintenance Activity - Sediment Removal

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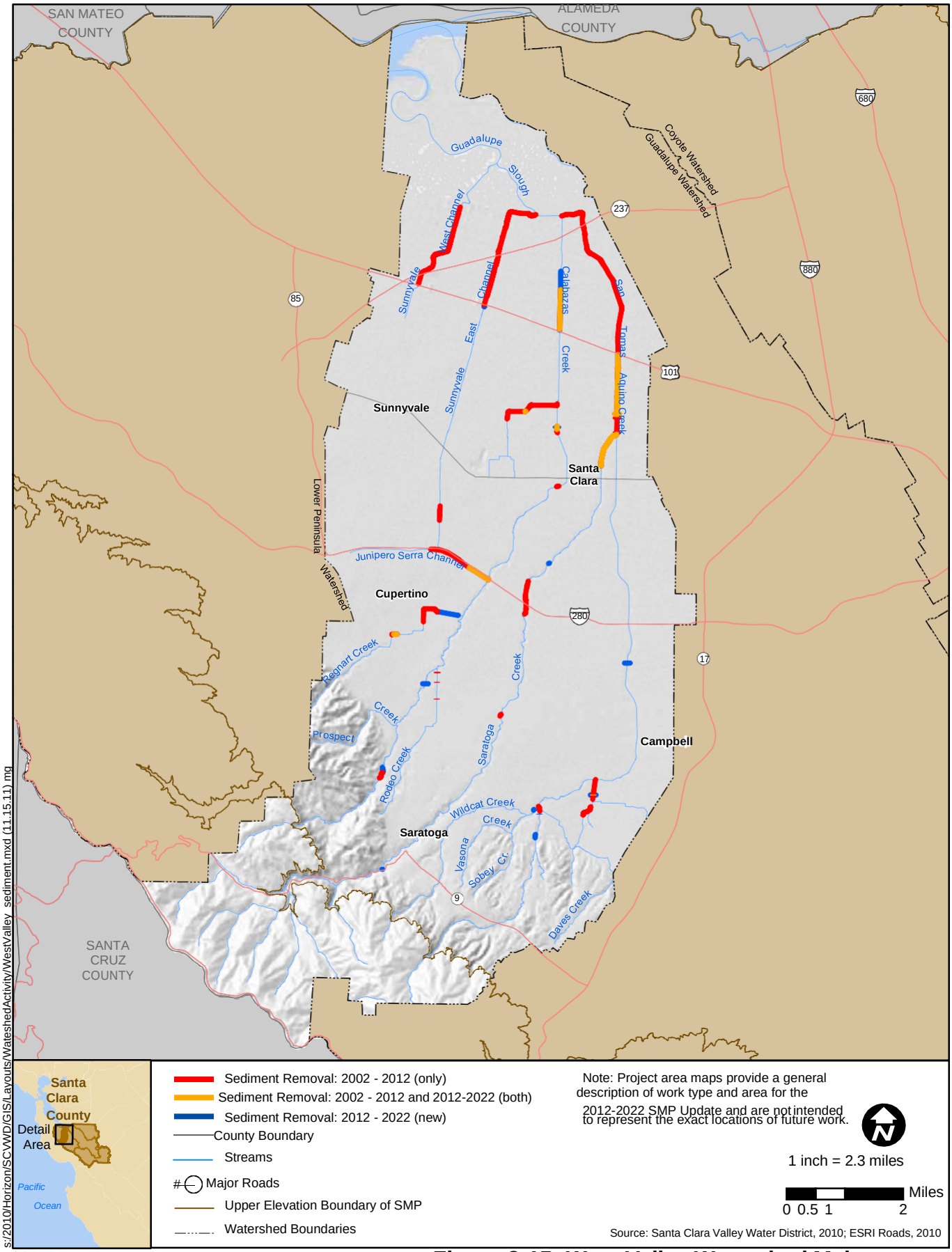

Horizon WATER and ENVIRONMENT

Figure 2-15: West Valley Watershed Maintenance Activity - Sediment Removal

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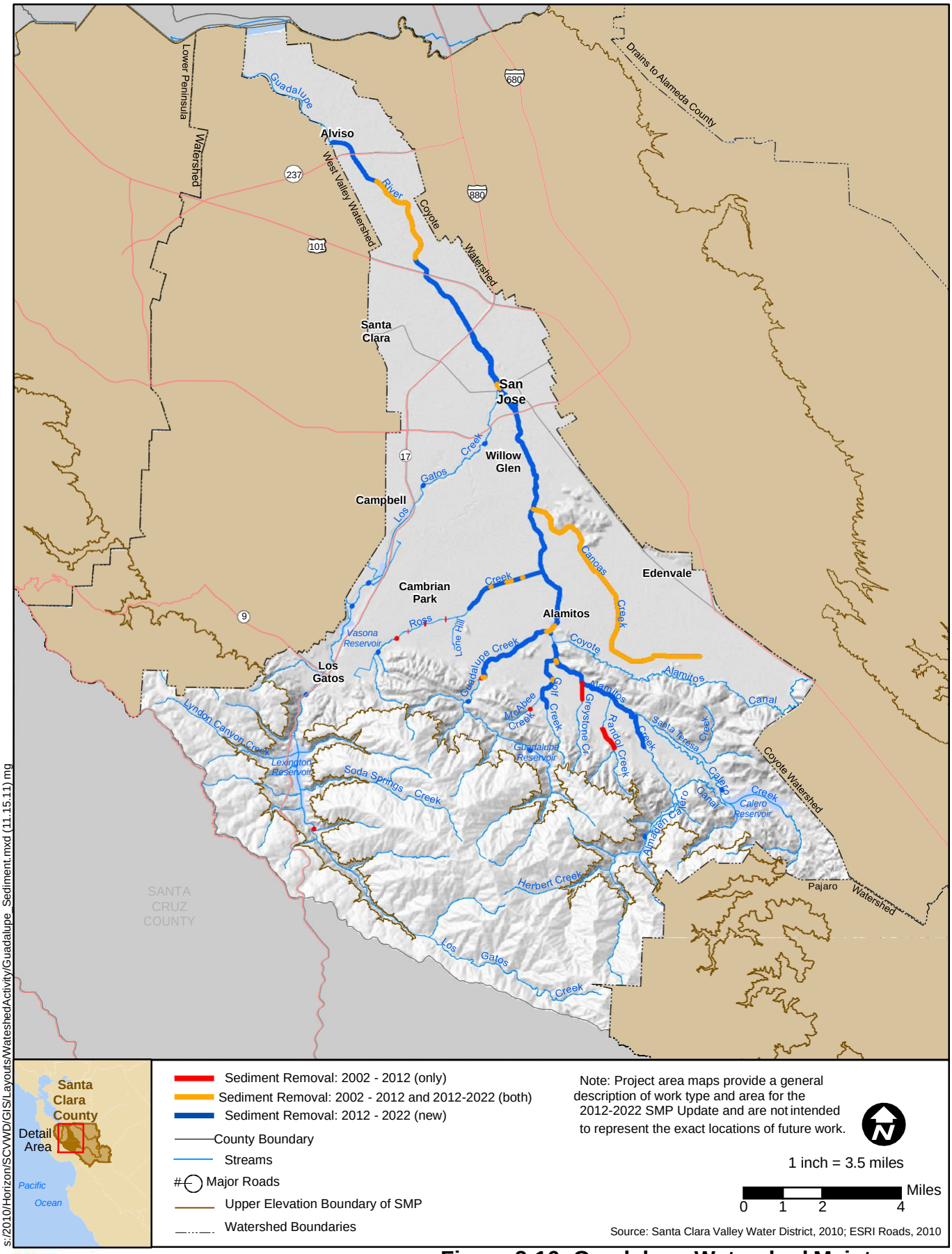

s:/2010/Horizon/SCVWD/GIS/Layouts/WatershedActivity/Guadalupe_Sediment.mxd (11.15.11) mg

Horizon WATER and ENVIRONMENT

Figure 2-16: Guadalupe Watershed Maintenance Activity - Sediment Removal

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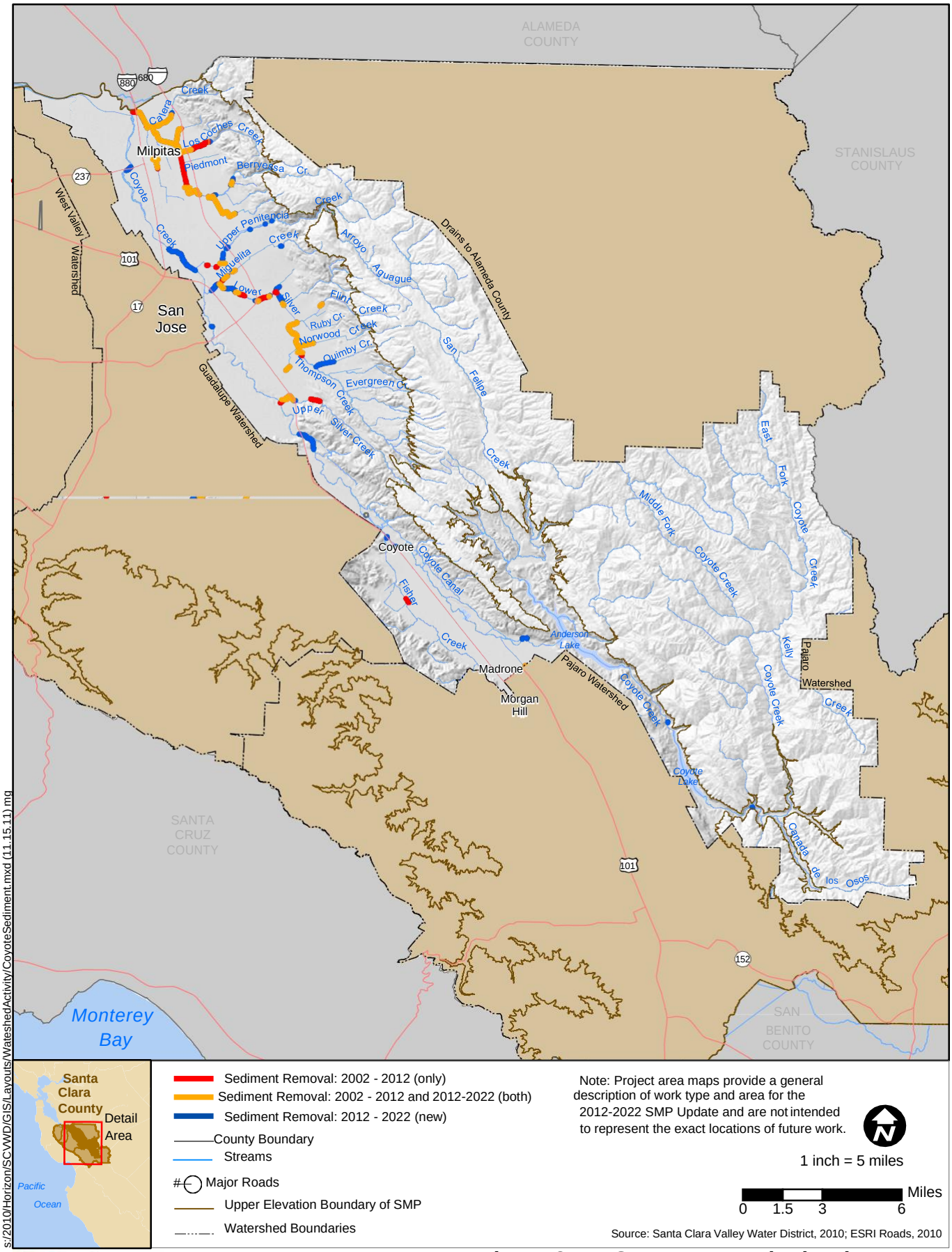

Horizon WATER and ENVIRONMENT

Figure 2-17: Coyote Watershed Maintenance Activity - Sediment Removal

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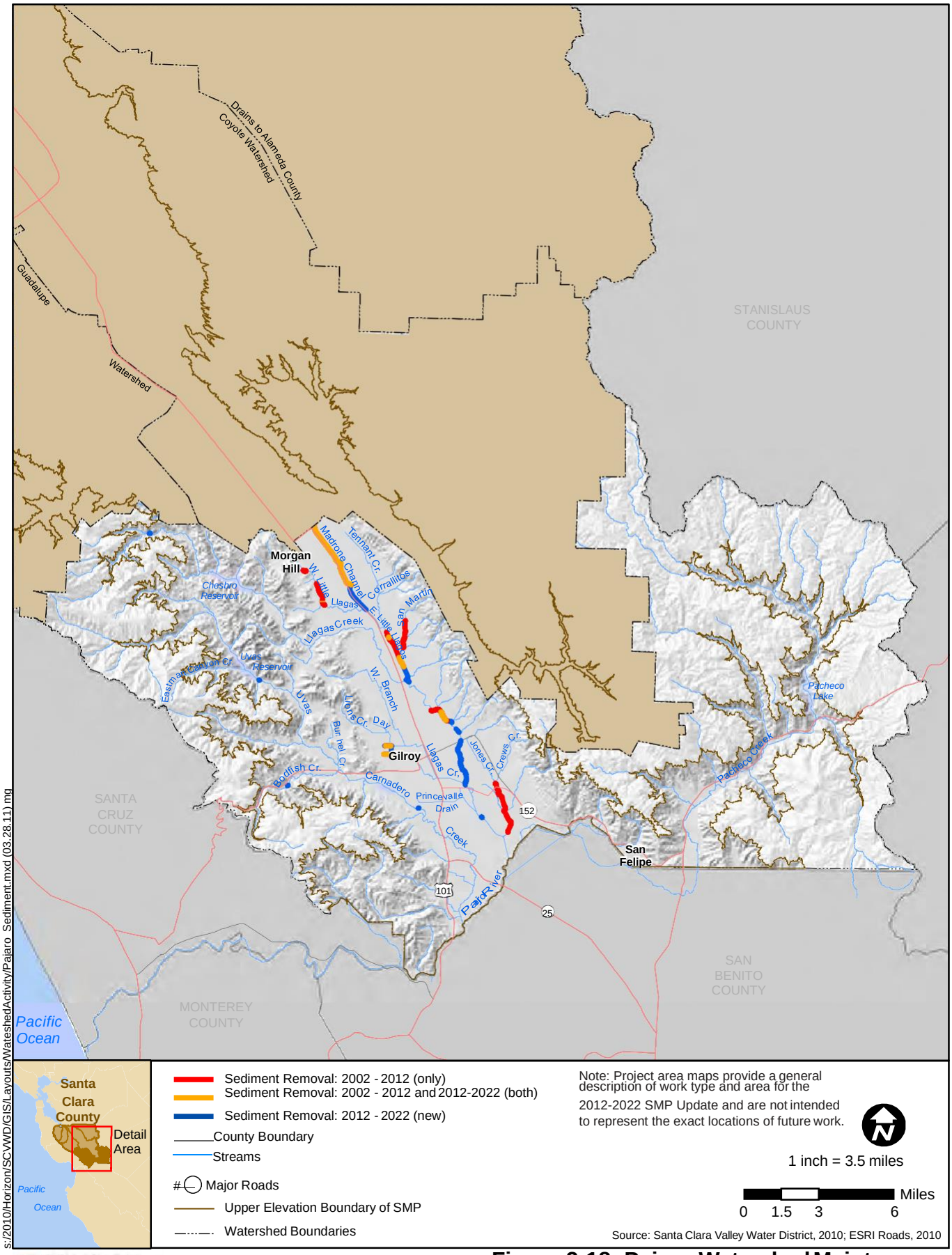

s:/2010/Horizon/SCVWD/GIS/Layouts/WatershedActivity/Pajaro_Sediment.mxd (03.28.11) mg

Horizon WATER and ENVIRONMENT

Figure 2-18: Pajaro Watershed Maintenance Activity - Sediment Removal

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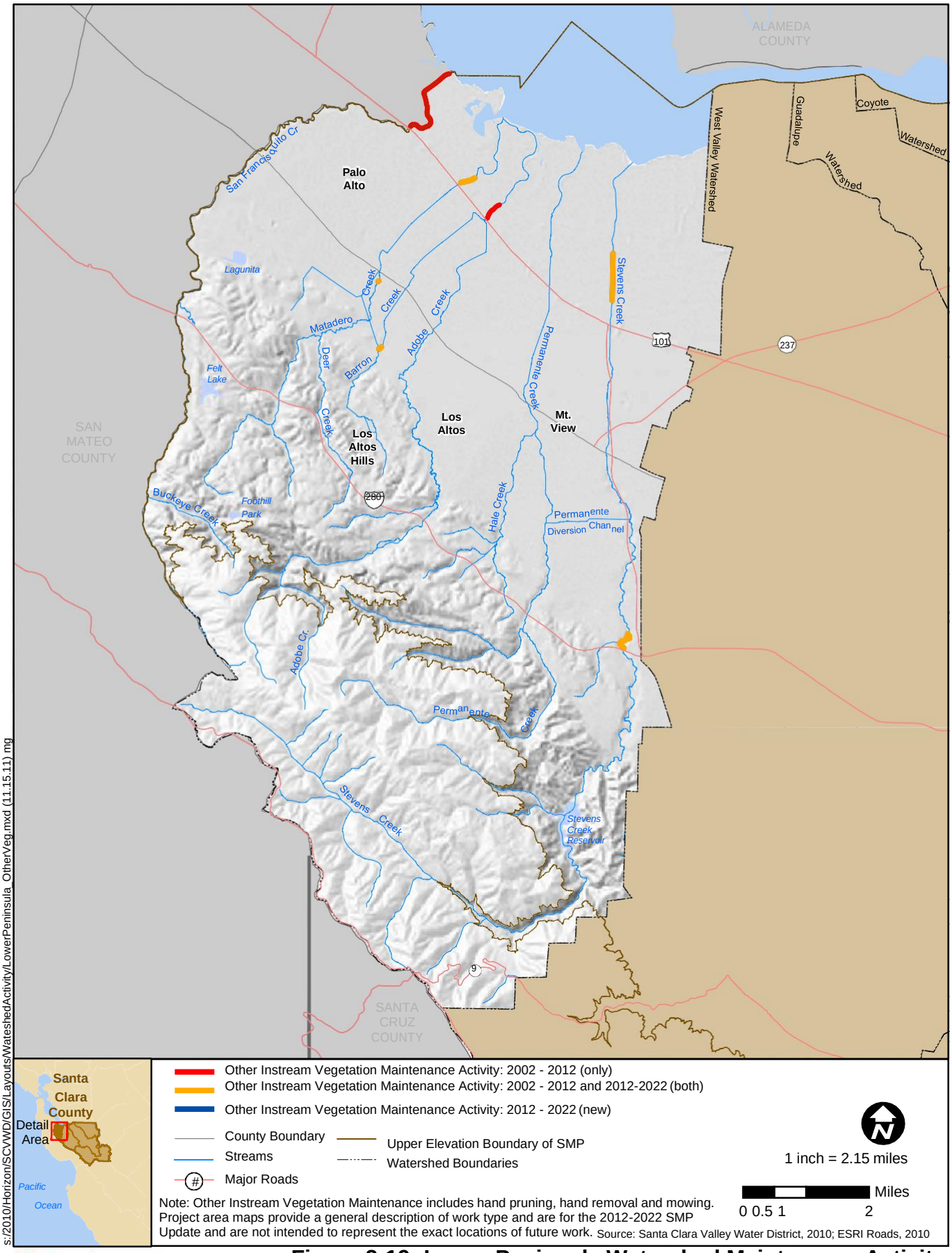

Note: Other Instream Vegetation Maintenance includes hand pruning, hand removal and mowing. Project area maps provide a general description of work type and are for the 2012-2022 SMP Update and are not intended to represent the exact locations of future work. Source: Santa Clara Valley Water District, 2010; ESRI Roads, 2010

s:/2010/Horizon/SCVWD/GIS/Layouts/WatershedActivity/LowerPeninsula_OtherVeg.mxd (11.15.11) mg

Horizon WATER and ENVIRONMENT

Figure 2-19: Lower Peninsula Watershed Maintenance Activity Other Instream Vegetation Maintenance

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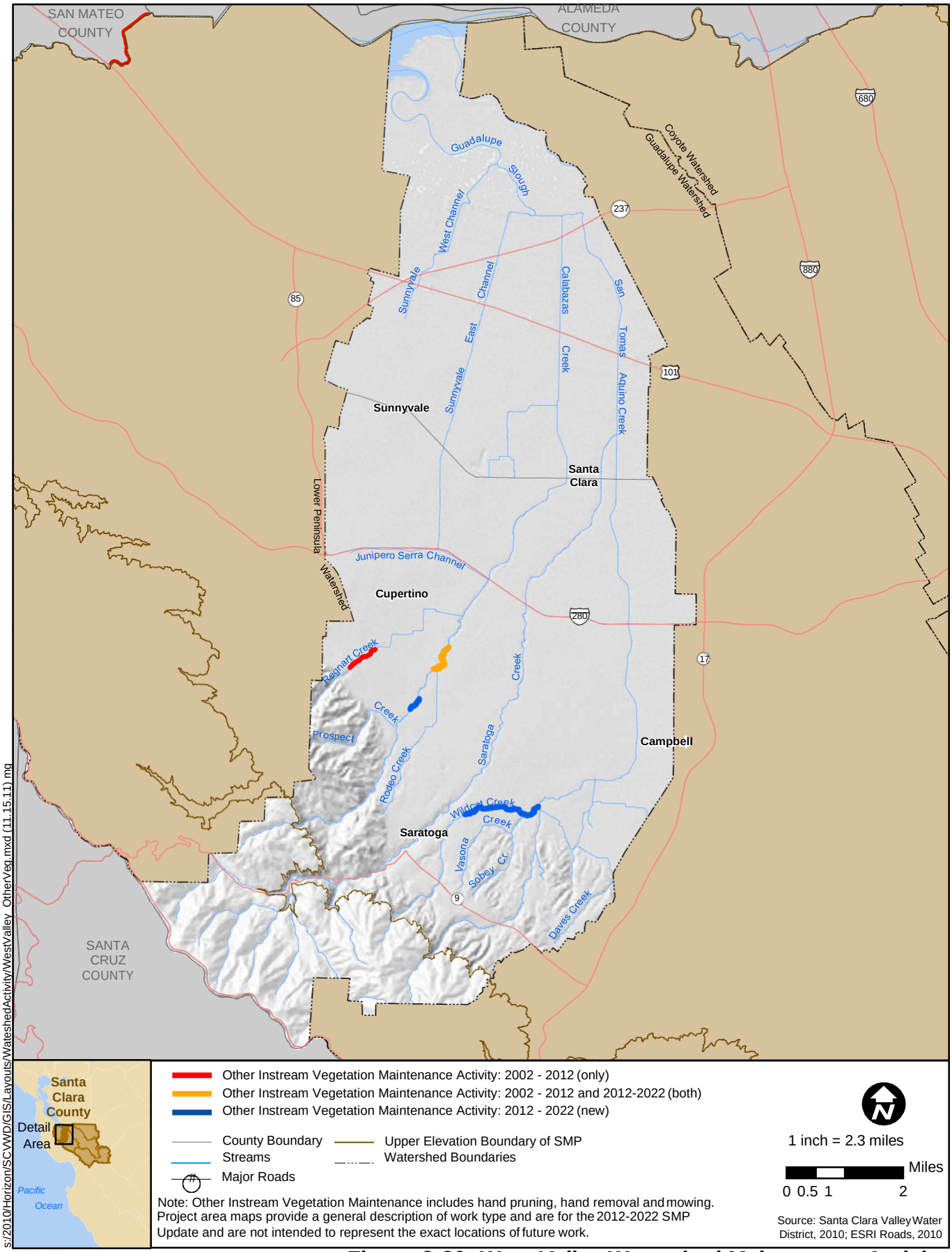

Horizon WATER and ENVIRONMENT

Figure 2-20: West Valley Watershed Maintenance Activity Other Instream Vegetation Maintenance

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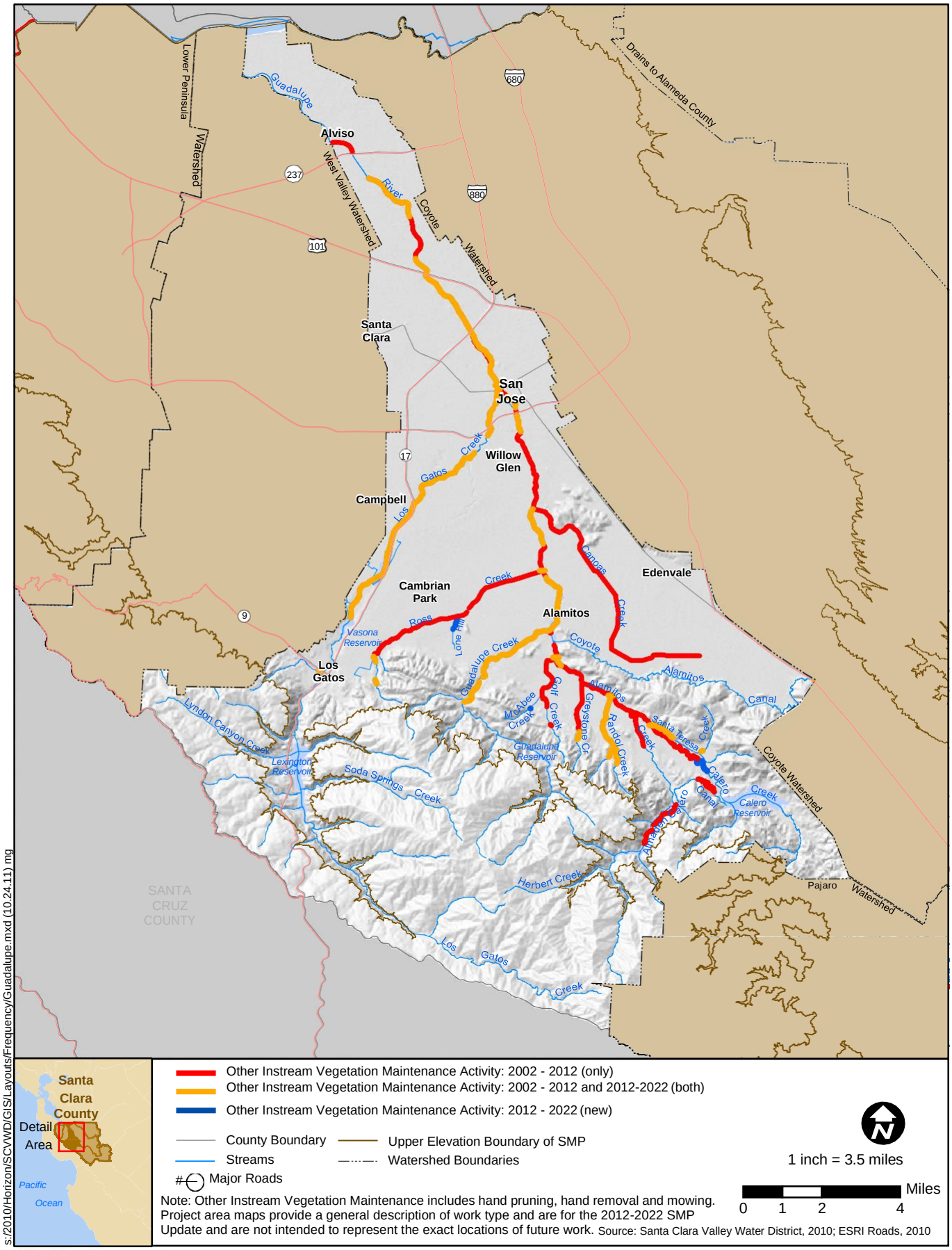

Note: Other Instream Vegetation Maintenance includes hand pruning, hand removal and mowing. Project area maps provide a general description of work type and are for the 2012-2022 SMP Update and are not intended to represent the exact locations of future work. Source: Santa Clara Valley Water District, 2010; ESRI Roads, 2010

s:/2010/Horizon/SCVWD/GIS/Layouts/Frequency/Guadalupe.mxd (10.24.11) mg

Horizon WATER and ENVIRONMENT

Figure 2-21: Guadalupe Watershed Maintenance Activity Other Instream Vegetation Maintenance

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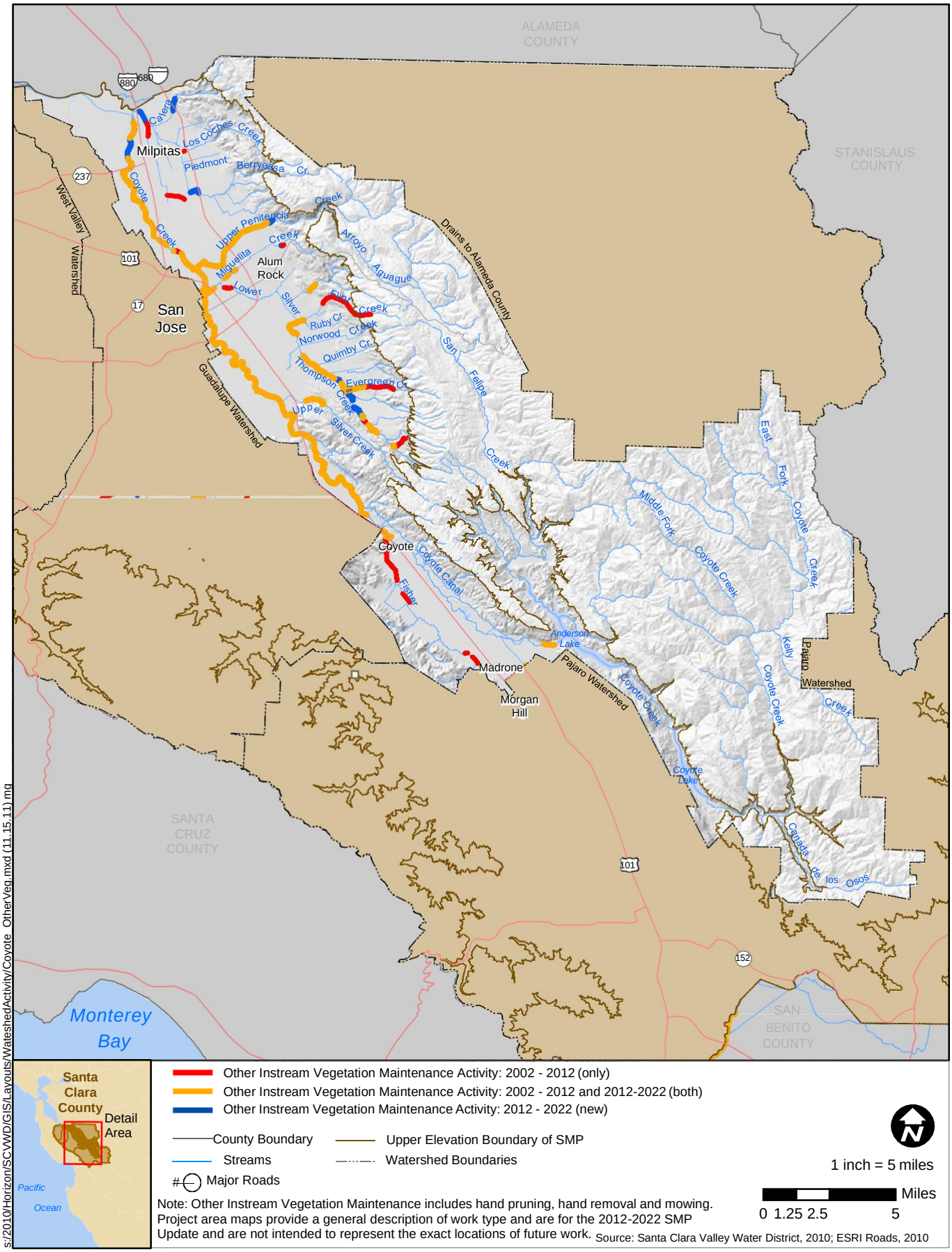

Other Instream Vegetation Maintenance Activity: 2002 - 2012 (only)
Other Instream Vegetation Maintenance Activity: 2002 - 2012 and 2012-2022 (both)
Other Instream Vegetation Maintenance Activity: 2012 - 2022 (new)

County Boundary
Streams
Major Roads
Upper Elevation Boundary of SMP
Watershed Boundaries

1 inch = 5 miles

0 1.25 2.5 5 Miles

Note: Other Instream Vegetation Maintenance includes hand pruning, hand removal and mowing. Project area maps provide a general description of work type and are for the 2012-2022 SMP Update and are not intended to represent the exact locations of future work.

Source: Santa Clara Valley Water District, 2010; ESRI Roads, 2010

s:/2010/Horizon/SCVWD/GIS/Layouts/WatershedActivity/Coyote_OtherVeg.mxd (11.15.11) mg

Horizon WATER and ENVIRONMENT

Figure 2-22: Coyote Watershed Maintenance Activity Other Instream Vegetation Maintenance

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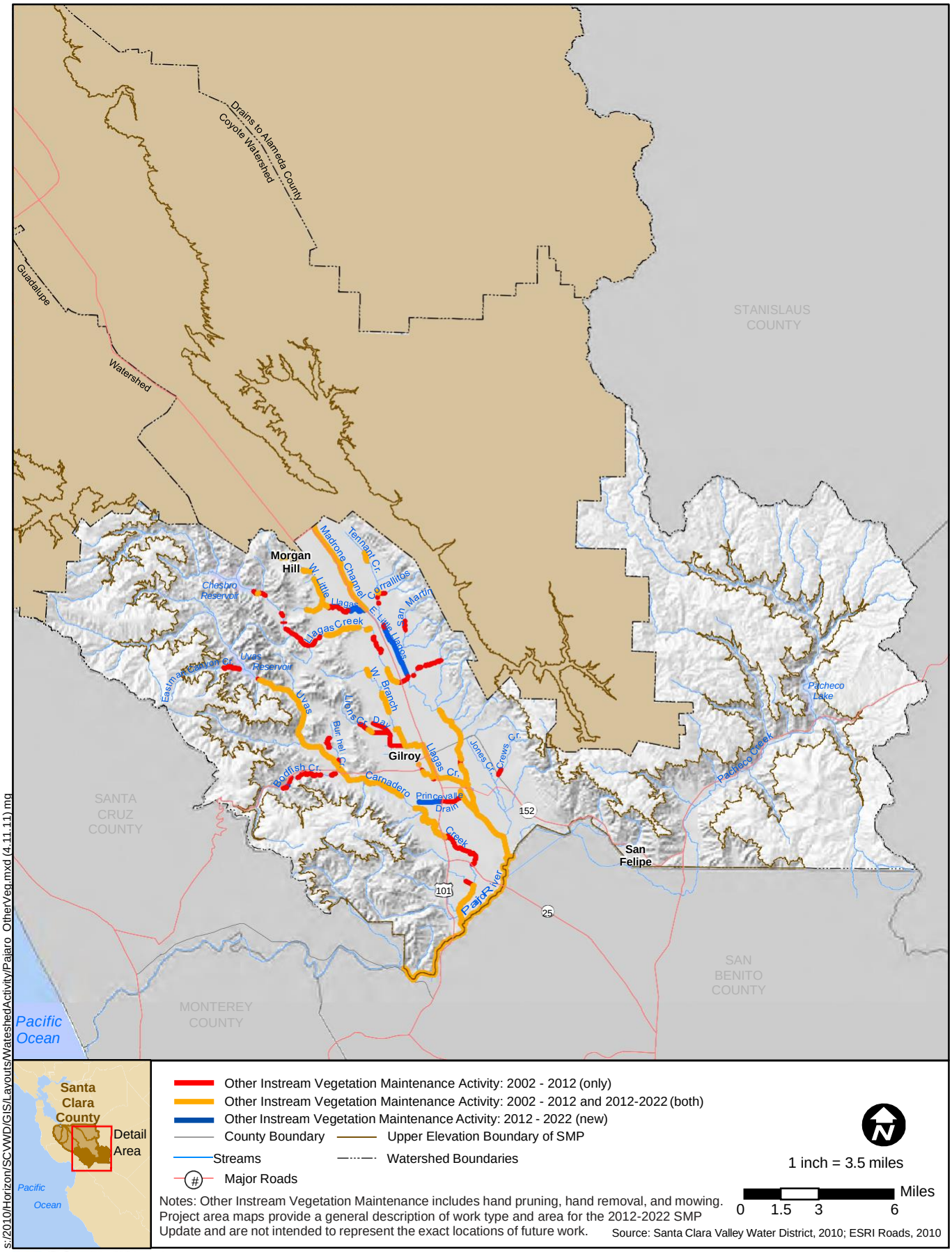

Notes: Other Instream Vegetation Maintenance includes hand pruning, hand removal, and mowing. Project area maps provide a general description of work type and area for the 2012-2022 SMP Update and are not intended to represent the exact locations of future work.

Source: Santa Clara Valley Water District, 2010; ESRI Roads, 2010

s:/2010/Horizon/SCVWD/GIS/Layouts/WatershedActivity/Pajaro_OtherVeg.mxd (4.11.11) mg

Horizon WATER and ENVIRONMENT

Figure 2-23: Pajaro Watershed Maintenance Activity Other Instream Vegetation Maintenance

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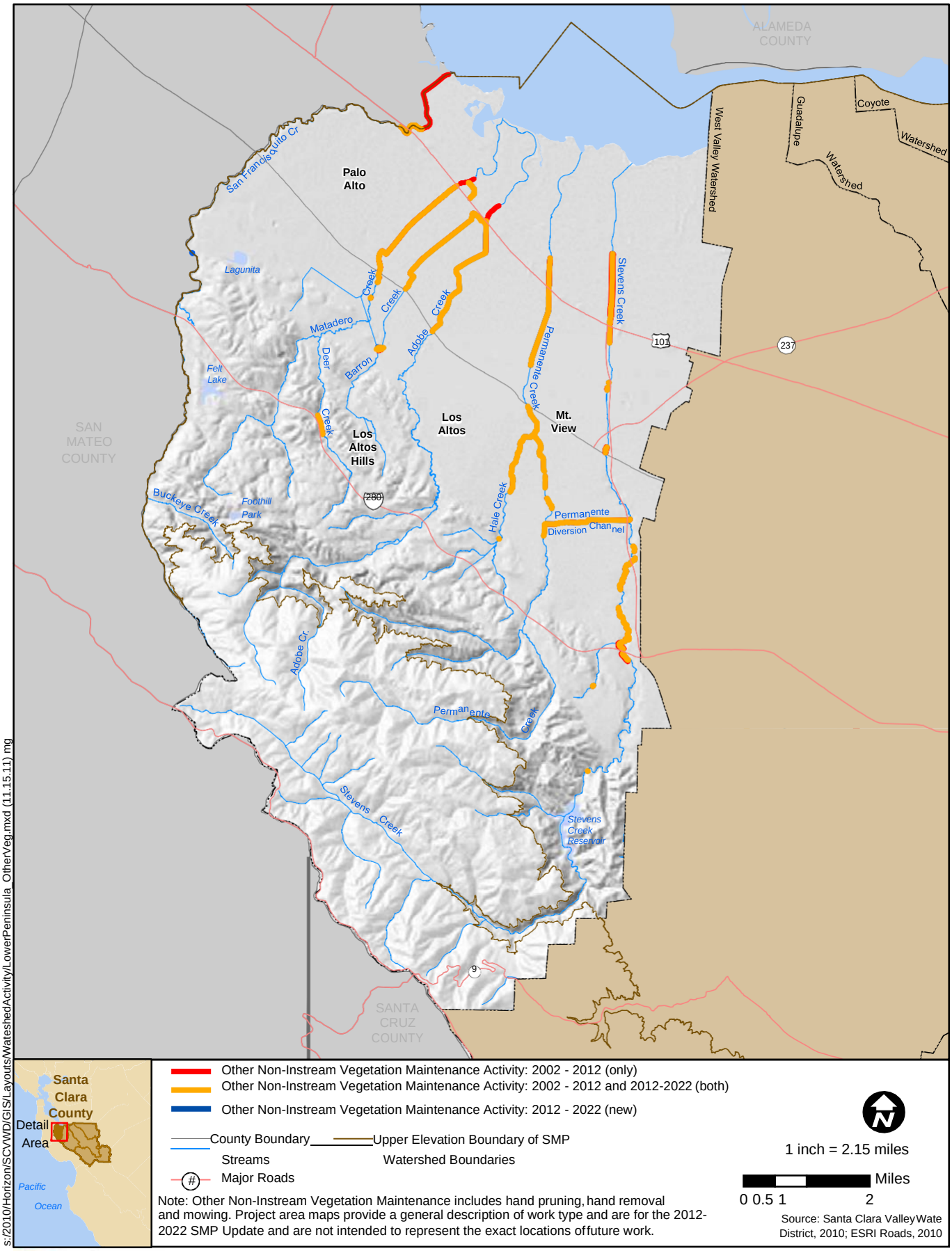

Note: Other Non-Instream Vegetation Maintenance includes hand pruning, hand removal and mowing. Project area maps provide a general description of work type and are for the 2012-2022 SMP Update and are not intended to represent the exact locations of future work.

s:/2010/Horizon/SCVWD/GIS/Layouts/WatershedActivity/LowerPeninsula_OtherVeg.mxd (11.15.11) mg

Horizon WATER and ENVIRONMENT

Figure 2-24: Lower Peninsula Watershed Maintenance Activity Other Non-Instream Vegetation Maintenance

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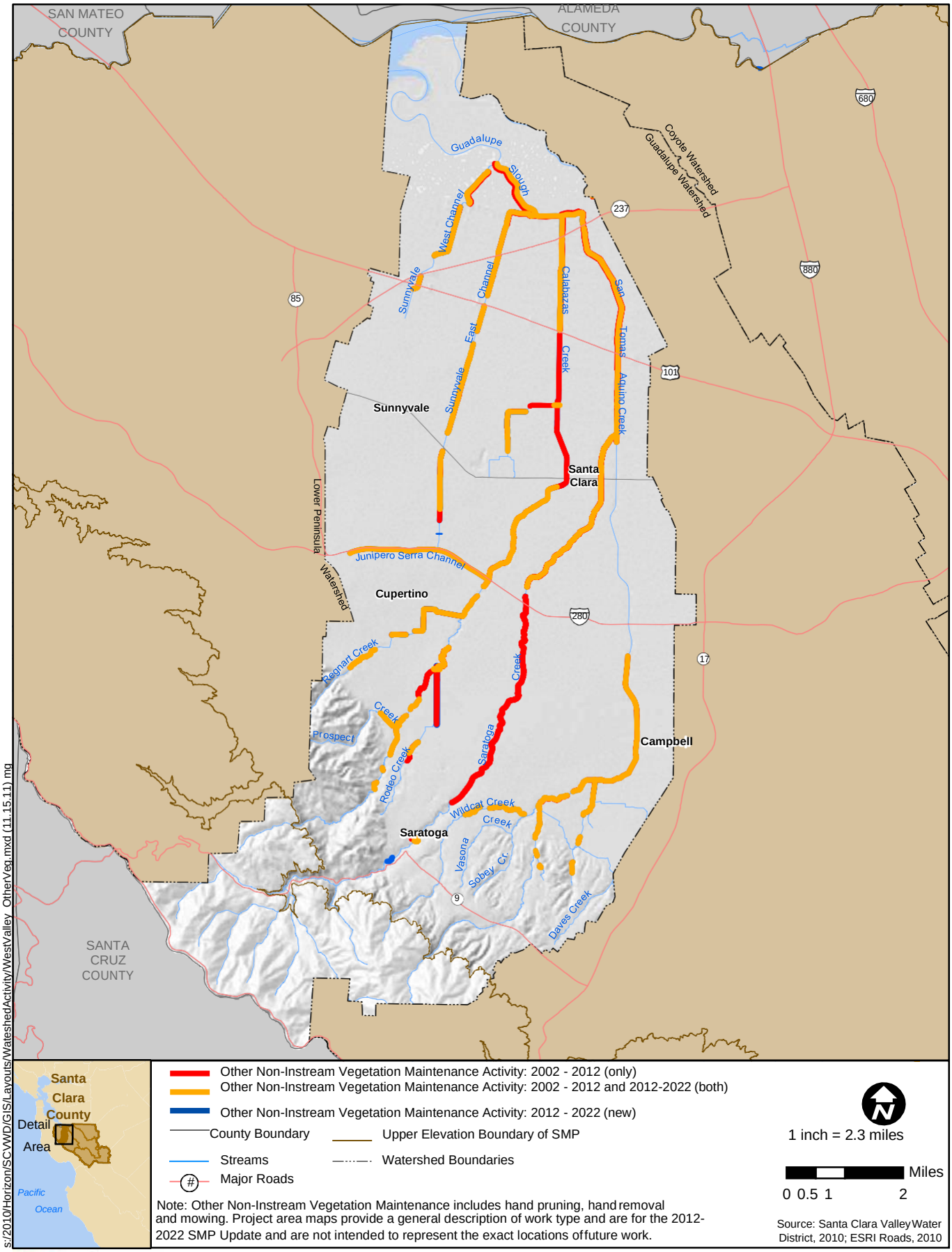

Note: Other Non-Instream Vegetation Maintenance includes hand pruning, hand removal and mowing. Project area maps provide a general description of work type and are for the 2012-2022 SMP Update and are not intended to represent the exact locations of future work.

s:/2010/Horizon/SCVWD/GIS/Layouts/WateshedActivity/WestValley_OtherVeg.mxd (11.15.11) mg

Horizon WATER and ENVIRONMENT

Figure 2-25: West Valley Watershed Maintenance Activity Other Non-Instream Vegetation Maintenance

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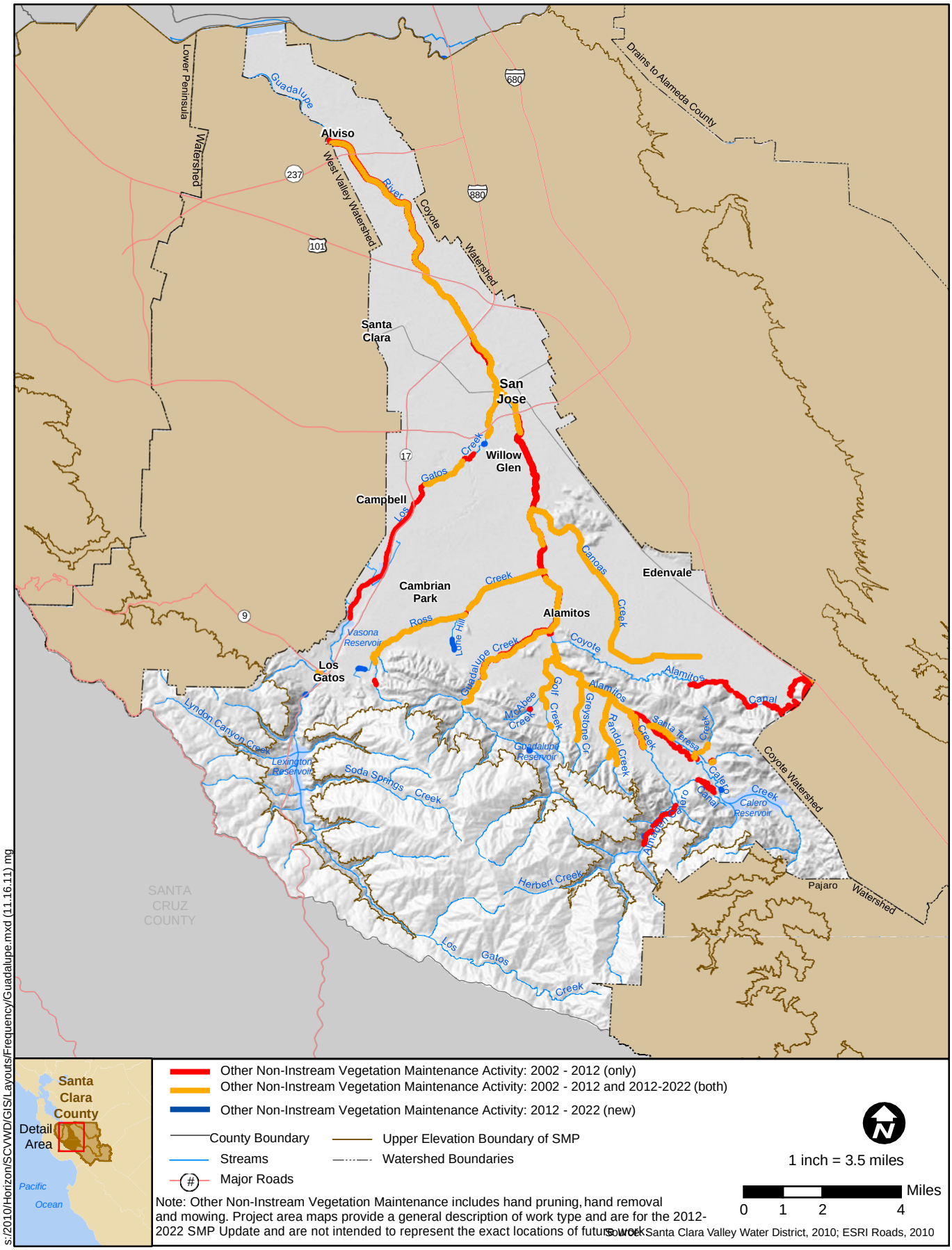

Note: Other Non-Instream Vegetation Maintenance includes hand pruning, hand removal and mowing. Project area maps provide a general description of work type and are for the 2012-2022 SMP Update and are not intended to represent the exact locations of future work.

s:/2010/Horizon/SCVWD/GIS/Layouts/Frequency/Guadalupe.mxd (11.16.11) mg

Horizon WATER and ENVIRONMENT

Figure 2-26: Guadalupe Watershed Maintenance Activity
Other Non-Instream Vegetation Maintenance

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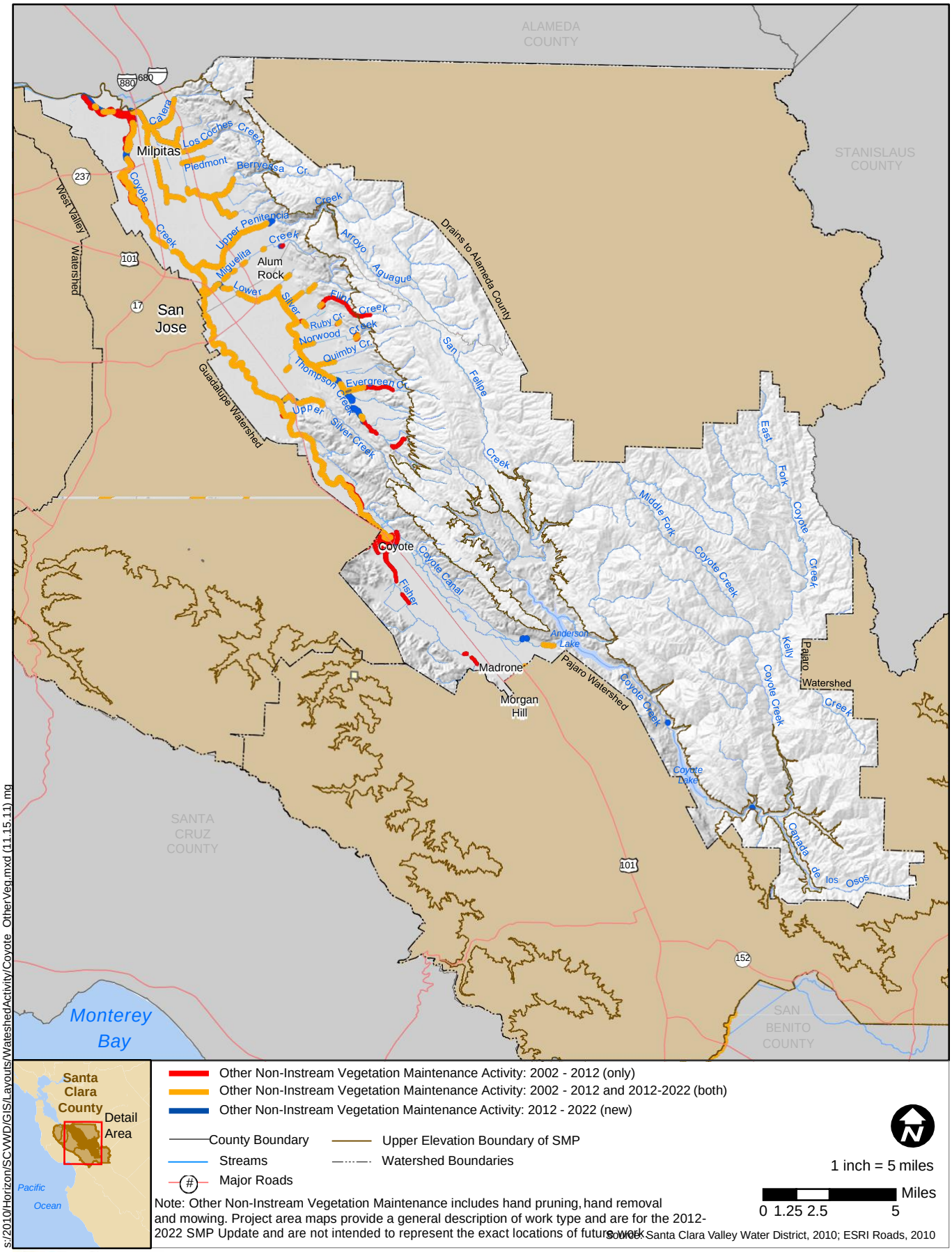

Horizon WATER and ENVIRONMENT

Figure 2-27: Coyote Watershed Maintenance Activity Other Non-Instream Vegetation Maintenance

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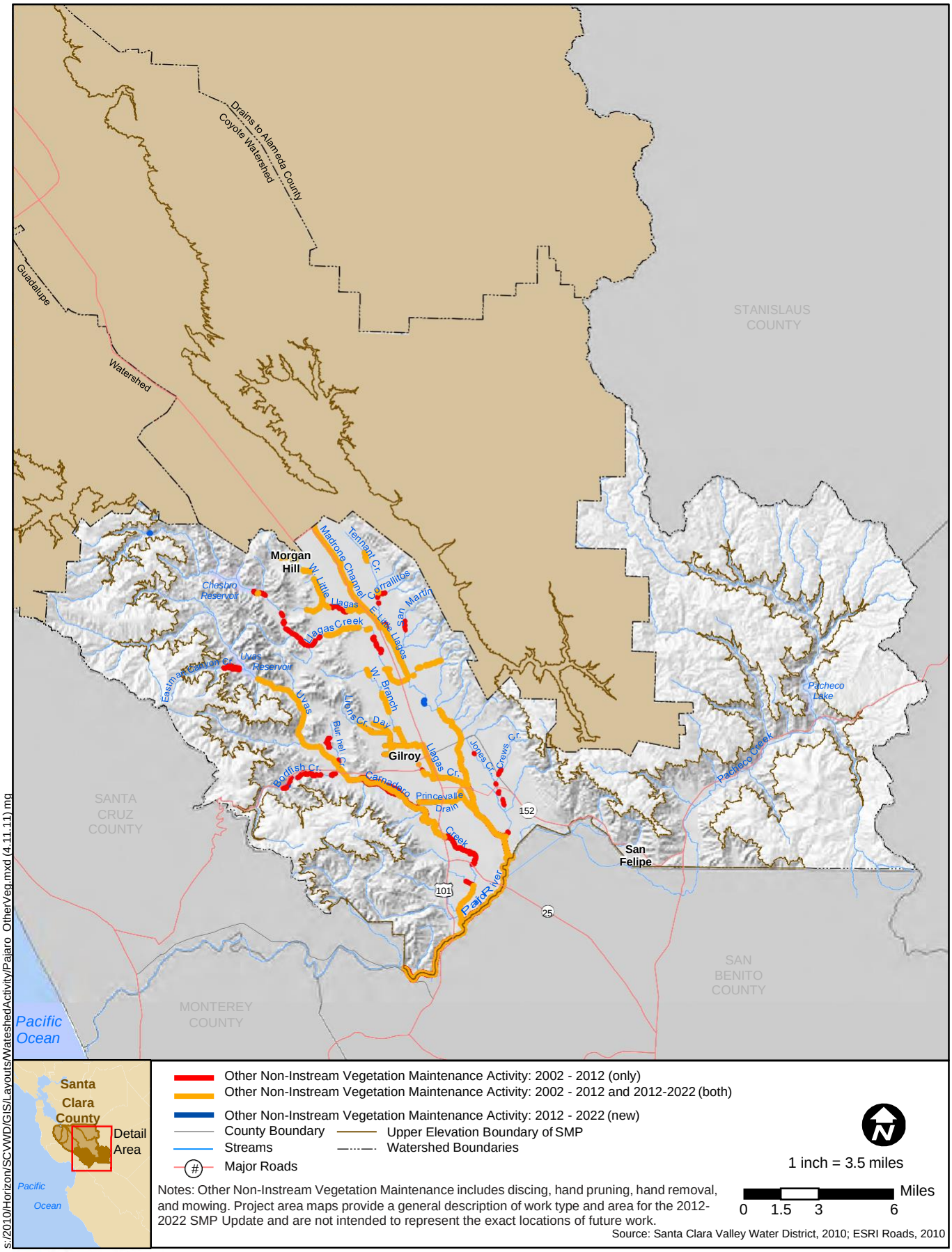

Notes: Other Non-Instream Vegetation Maintenance includes discing, hand pruning, hand removal, and mowing. Project area maps provide a general description of work type and area for the 2012-2022 SMP Update and are not intended to represent the exact locations of future work.

Source: Santa Clara Valley Water District, 2010; ESRI Roads, 2010

s:/2010/Horizon/SCVWD/GIS/Layouts/WatershedActivity/Pajaro_OtherVeg.mxd (4.11.11) mg

Horizon WATER and ENVIRONMENT

Figure 2-28: Pajaro Watershed Maintenance Activity Other Non-Instream Vegetation Maintenance

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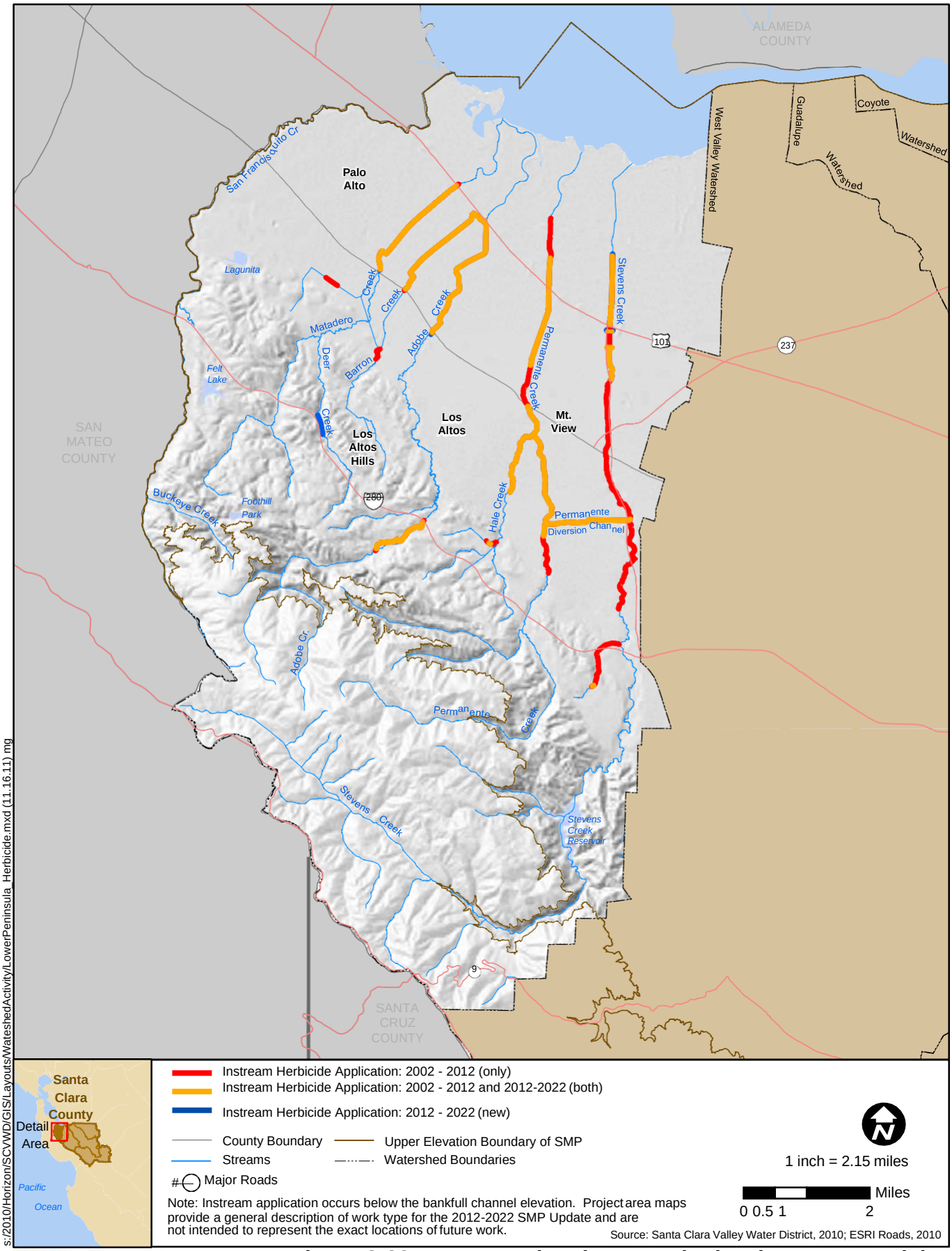

Horizon WATER and ENVIRONMENT

Figure 2-29: Lower Peninsula Watershed Maintenance Activity Instream Herbicide Application

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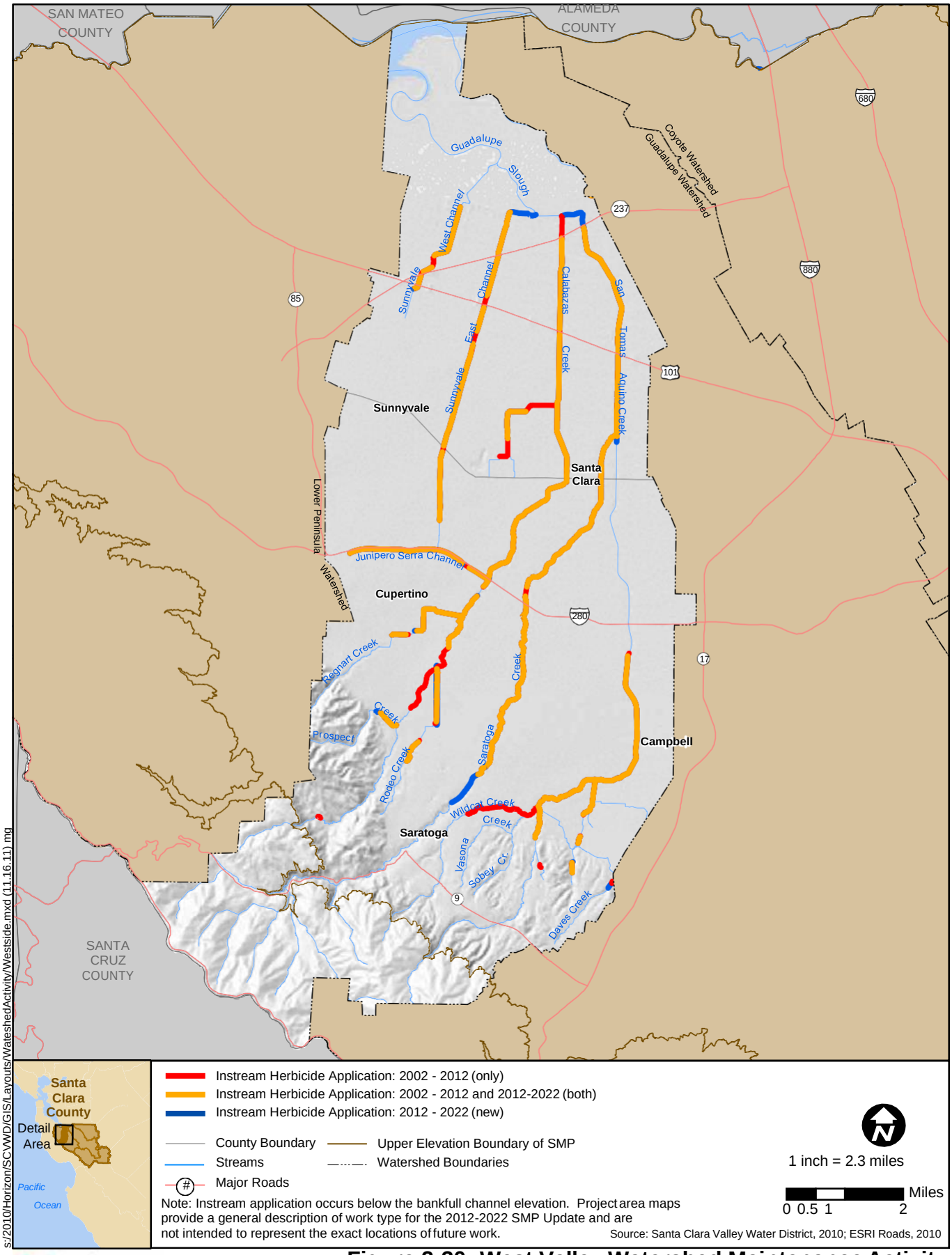

Horizon WATER and ENVIRONMENT

Figure 2-30: West Valley Watershed Maintenance Activity Instream Herbicide Application

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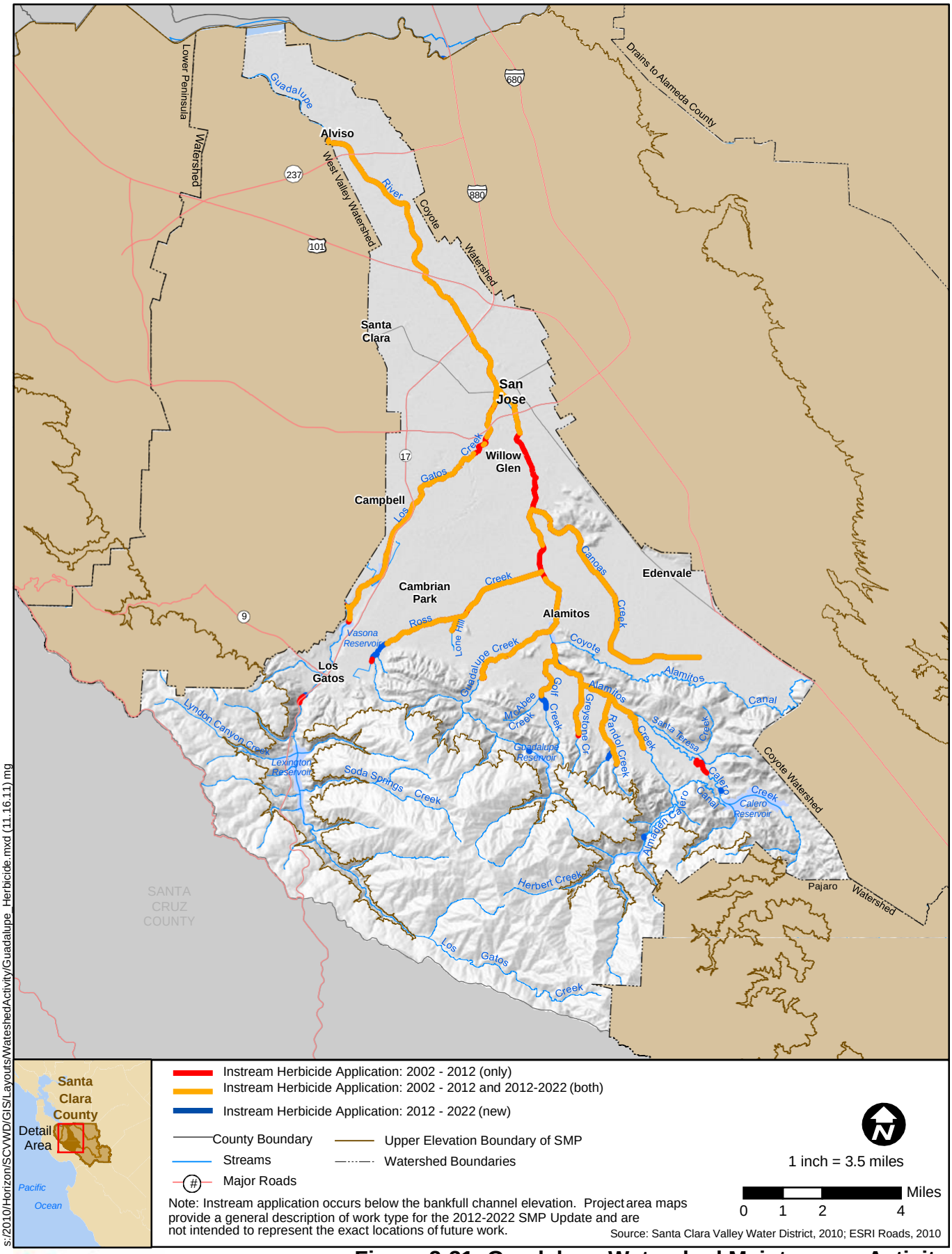

s:/2010/Horizon/SCVWD/GIS/Layouts/WatershedActivity/Guadalupe_Herbicide.mxd (11.16.11) mg

Horizon WATER and ENVIRONMENT

Figure 2-31: Guadalupe Watershed Maintenance Activity Instream Herbicide Application

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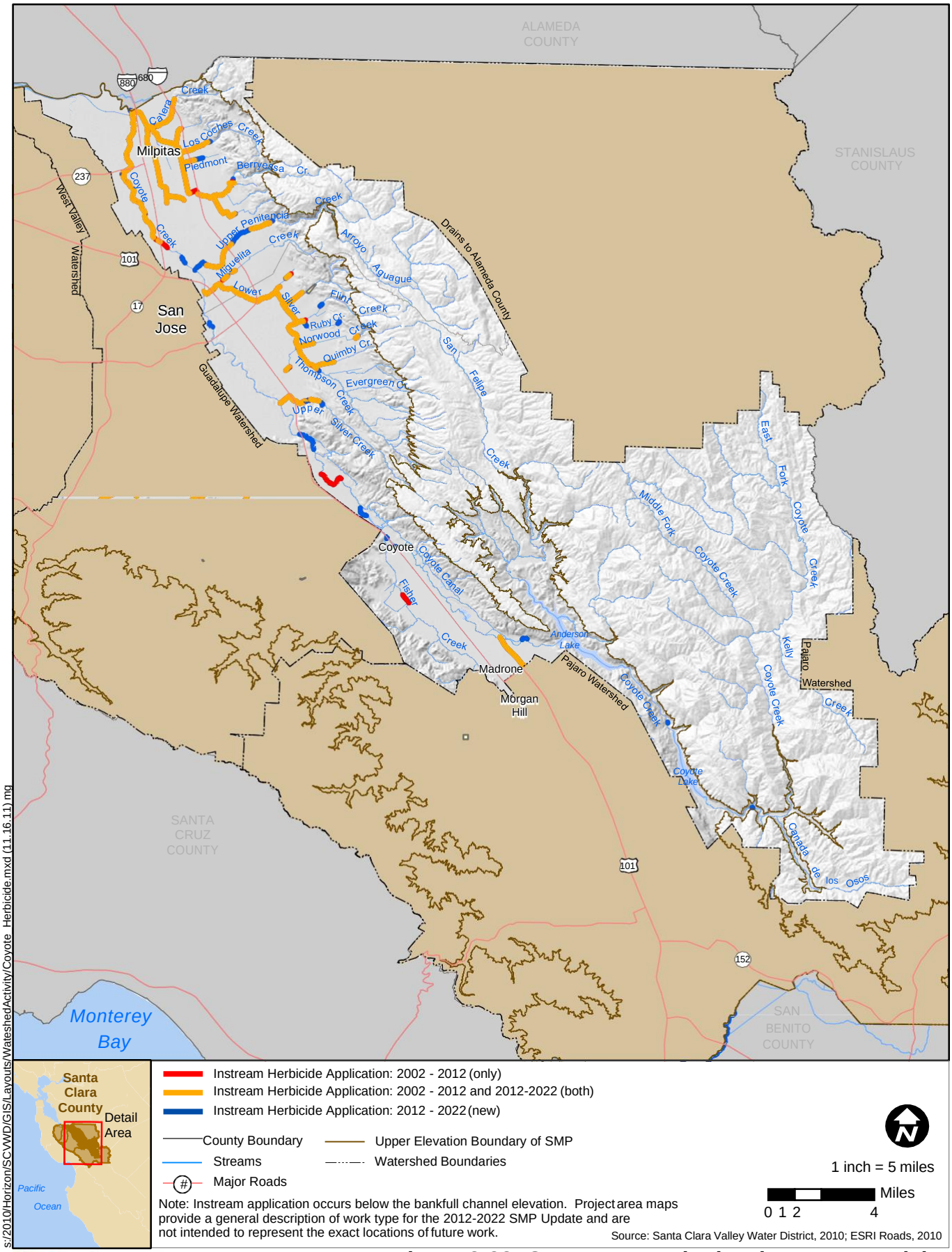

Horizon WATER and ENVIRONMENT

Figure 2-32: Coyote Watershed Maintenance Activity Instream Herbicide Application

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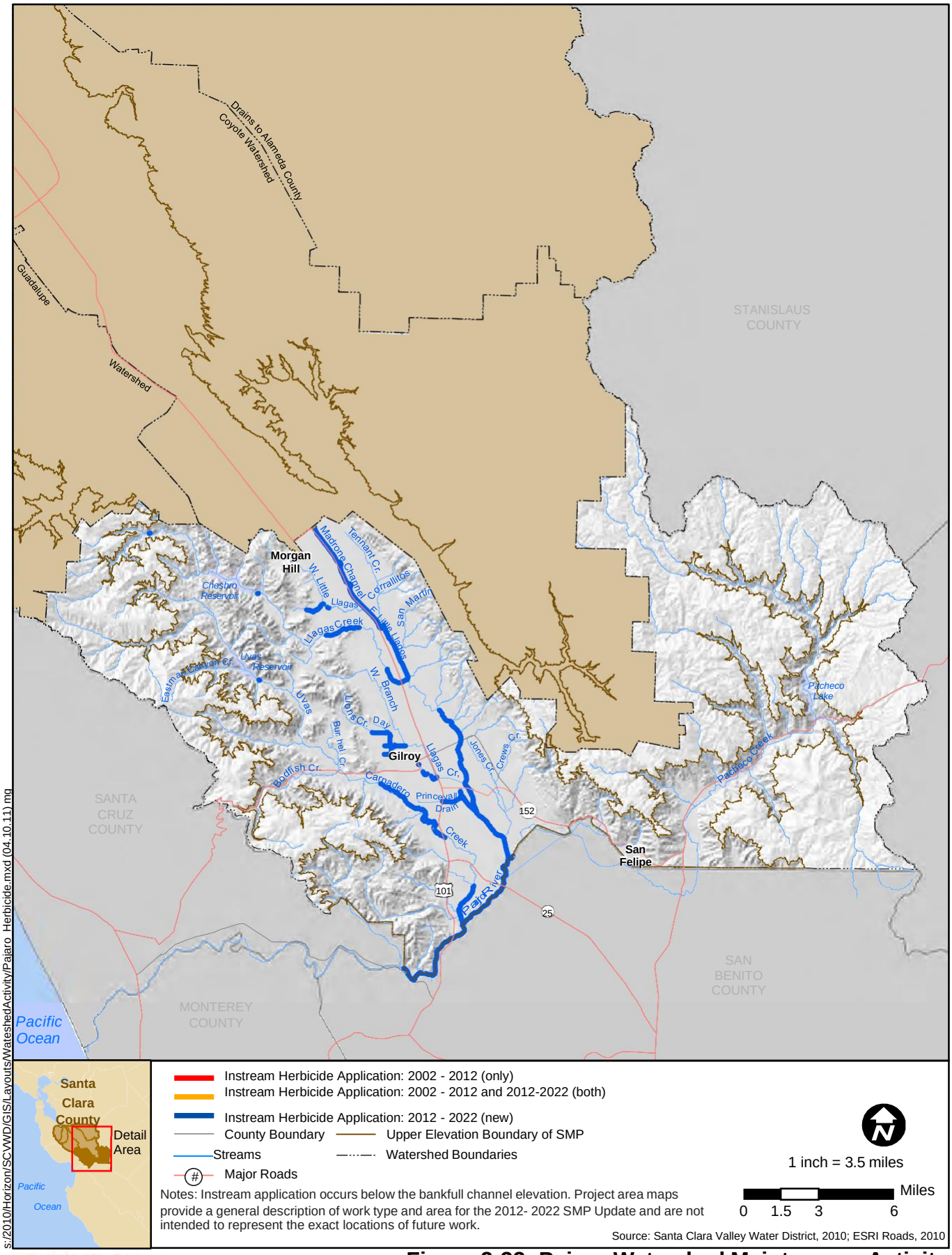

Notes: Instream application occurs below the bankfull channel elevation. Project area maps provide a general description of work type and area for the 2012- 2022 SMP Update and are not intended to represent the exact locations of future work.

Source: Santa Clara Valley Water District, 2010; ESRI Roads, 2010

s:/2010/Horizon/SCVWD/GIS/Layouts/WatershedActivity/Pajaro_Herbicide.mxd (04.10.11) mg

Horizon WATER and ENVIRONMENT

Figure 2-33: Pajaro Watershed Maintenance Activity Instream Herbicide Application

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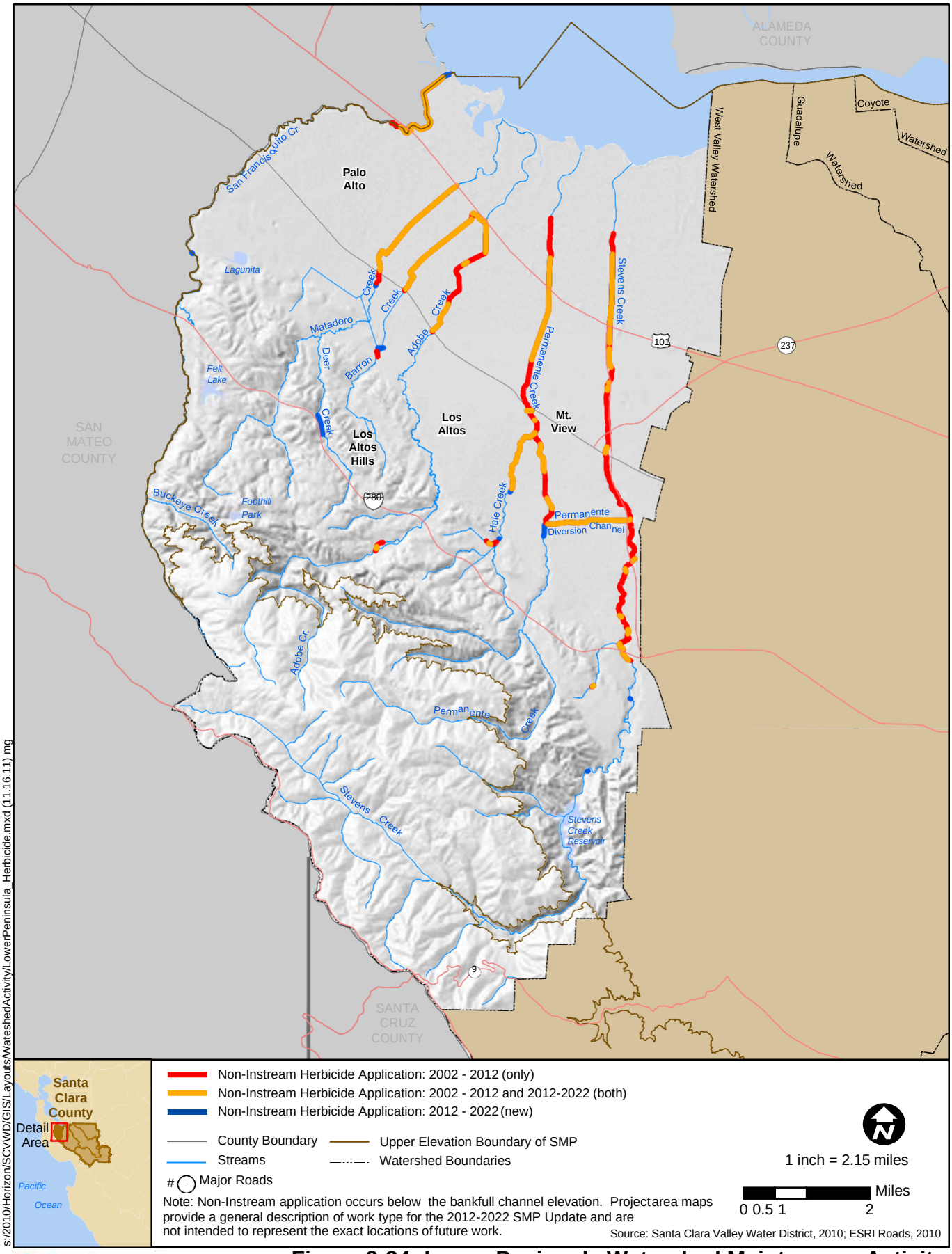

Horizon WATER and ENVIRONMENT

Figure 2-34: Lower Peninsula Watershed Maintenance Activity Non-Instream Herbicide Application

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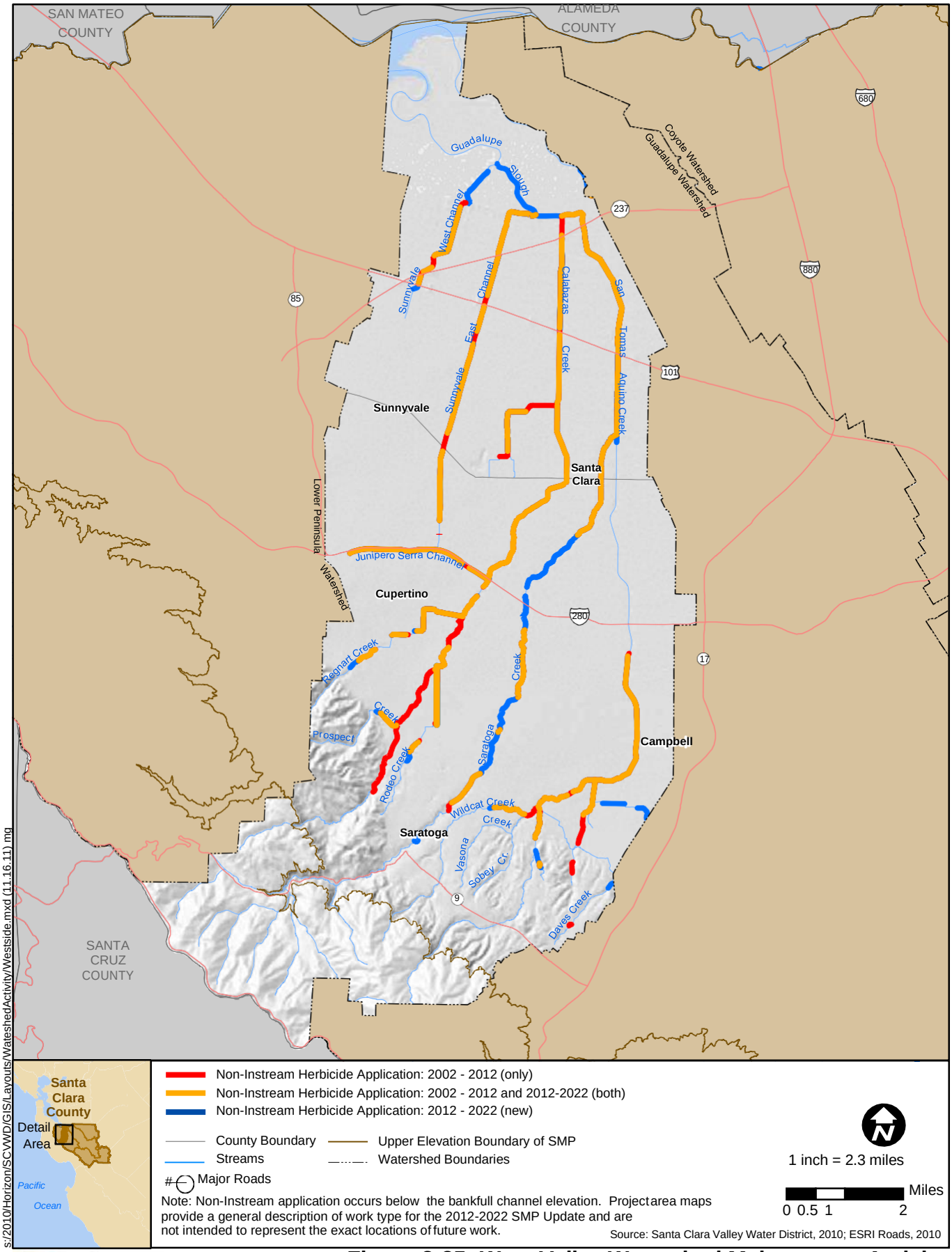

Horizon WATER and ENVIRONMENT

Figure 2-35: West Valley Watershed Maintenance Activity Non-Instream Herbicide Application

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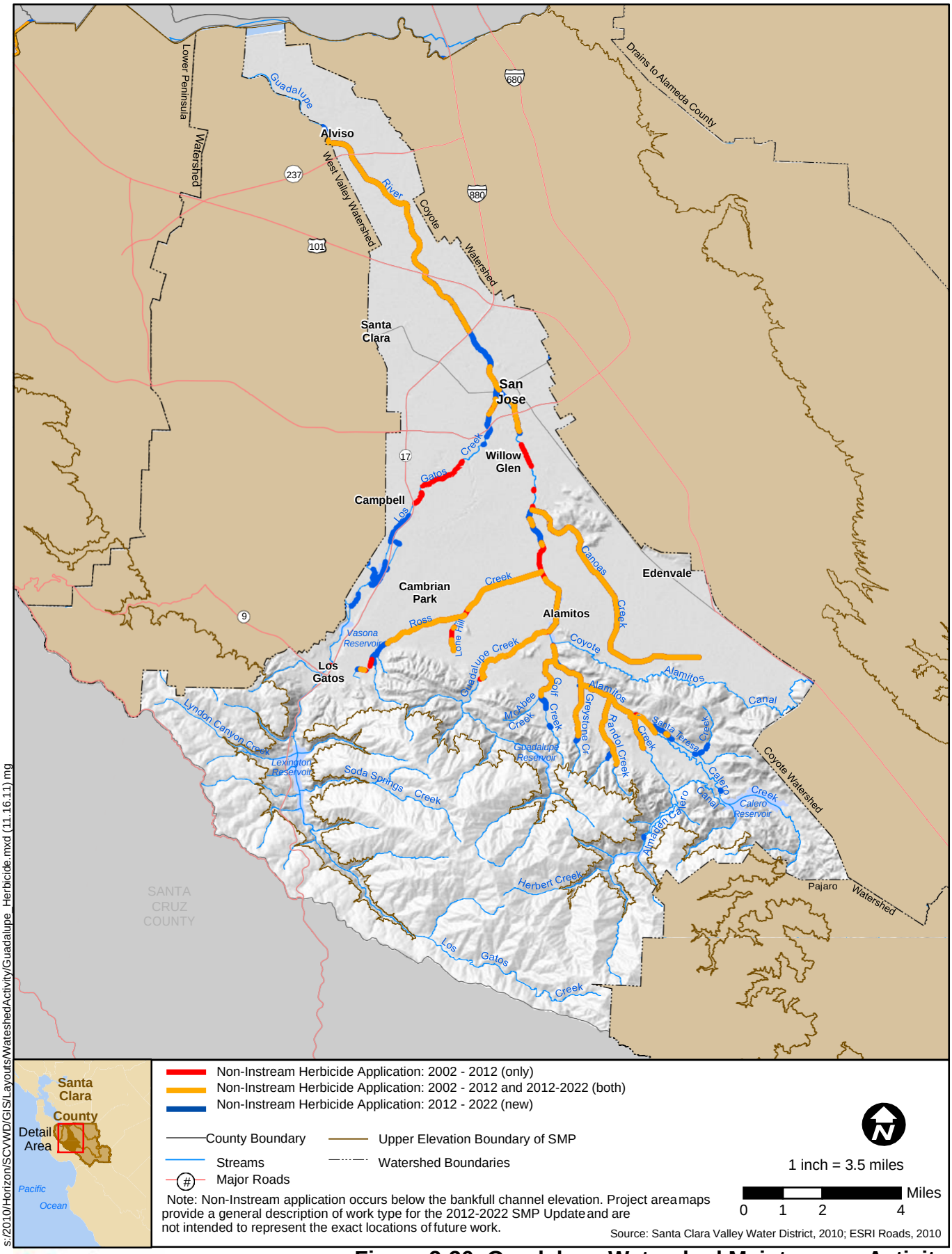

Figure 2-36: Guadalupe Watershed Maintenance Activity Non-Instream Herbicide Application

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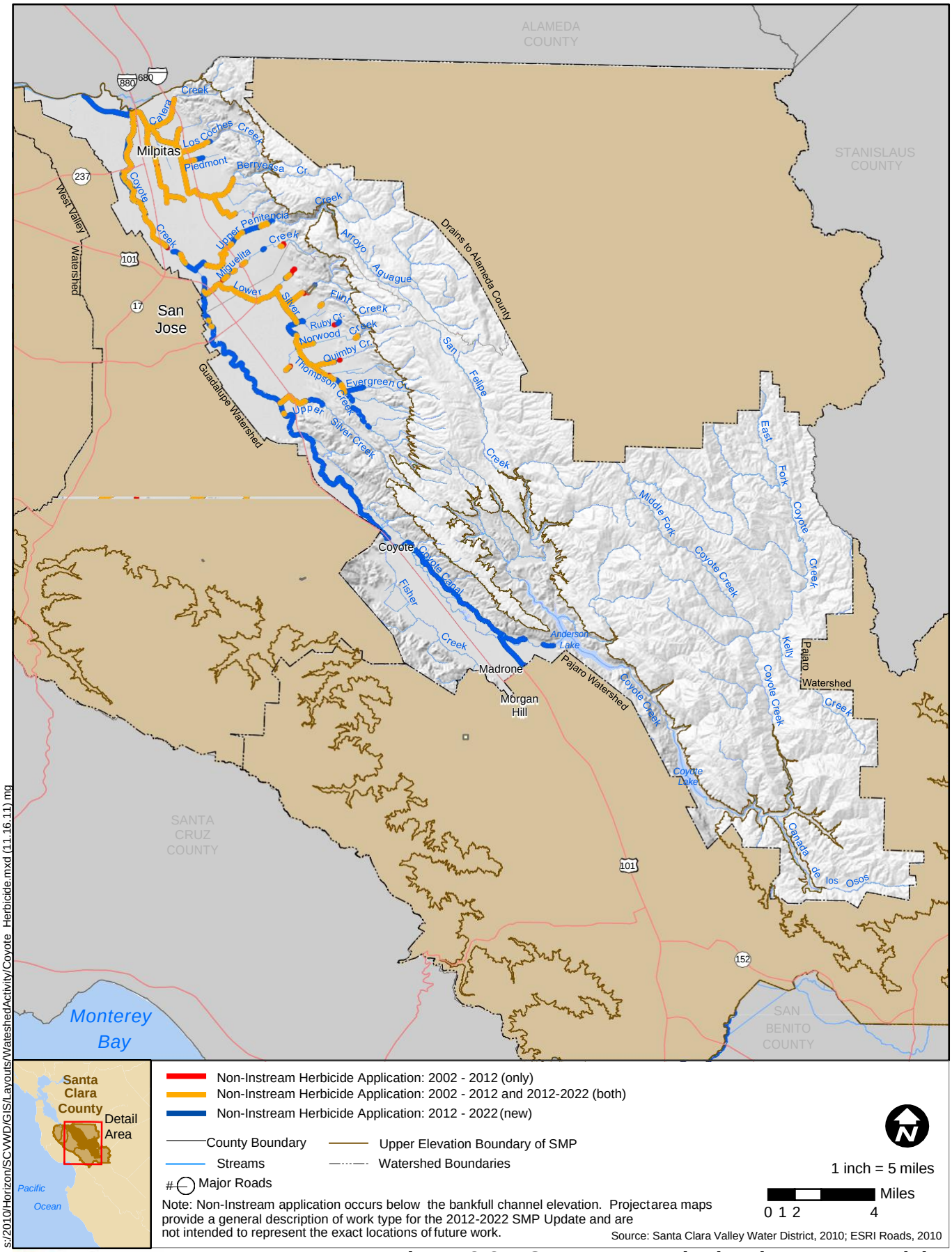

Horizon WATER and ENVIRONMENT

Figure 2-37: Coyote Watershed Maintenance Activity Non-Instream Herbicide Application

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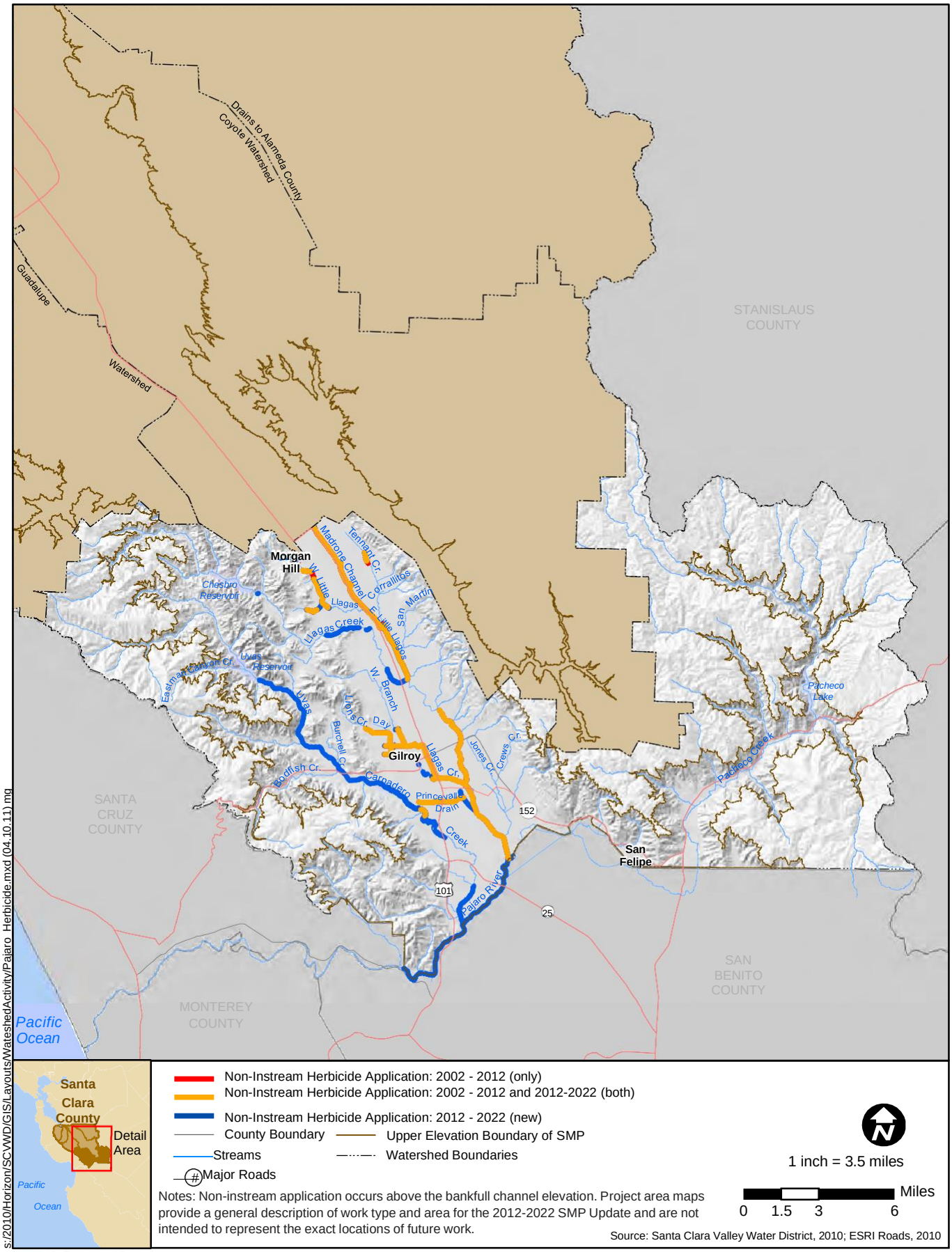

Non-Instream Herbicide Application: 2002 - 2012 (only)
Non-Instream Herbicide Application: 2002 - 2012 and 2012-2022 (both)
Non-Instream Herbicide Application: 2012 - 2022 (new)
County Boundary
Upper Elevation Boundary of SMP
Streams
Watershed Boundaries
Major Roads

1 inch = 3.5 miles

Miles
0 1.5 3 6

Notes: Non-instream application occurs above the bankfull channel elevation. Project area maps provide a general description of work type and area for the 2012-2022 SMP Update and are not intended to represent the exact locations of future work.

Source: Santa Clara Valley Water District, 2010; ESRI Roads, 2010

s:/2010/Horizon/SCVWD/GIS/Layouts/WatershedActivity/Pajaro_Herbicide.mxd (04.10.11) mg

Horizon WATER and ENVIRONMENT

Figure 2-38: Pajaro Watershed Maintenance Activity Non-Instream Herbicide Application

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Horizon WATER and ENVIRONMENT

Figure 2-39. Canals

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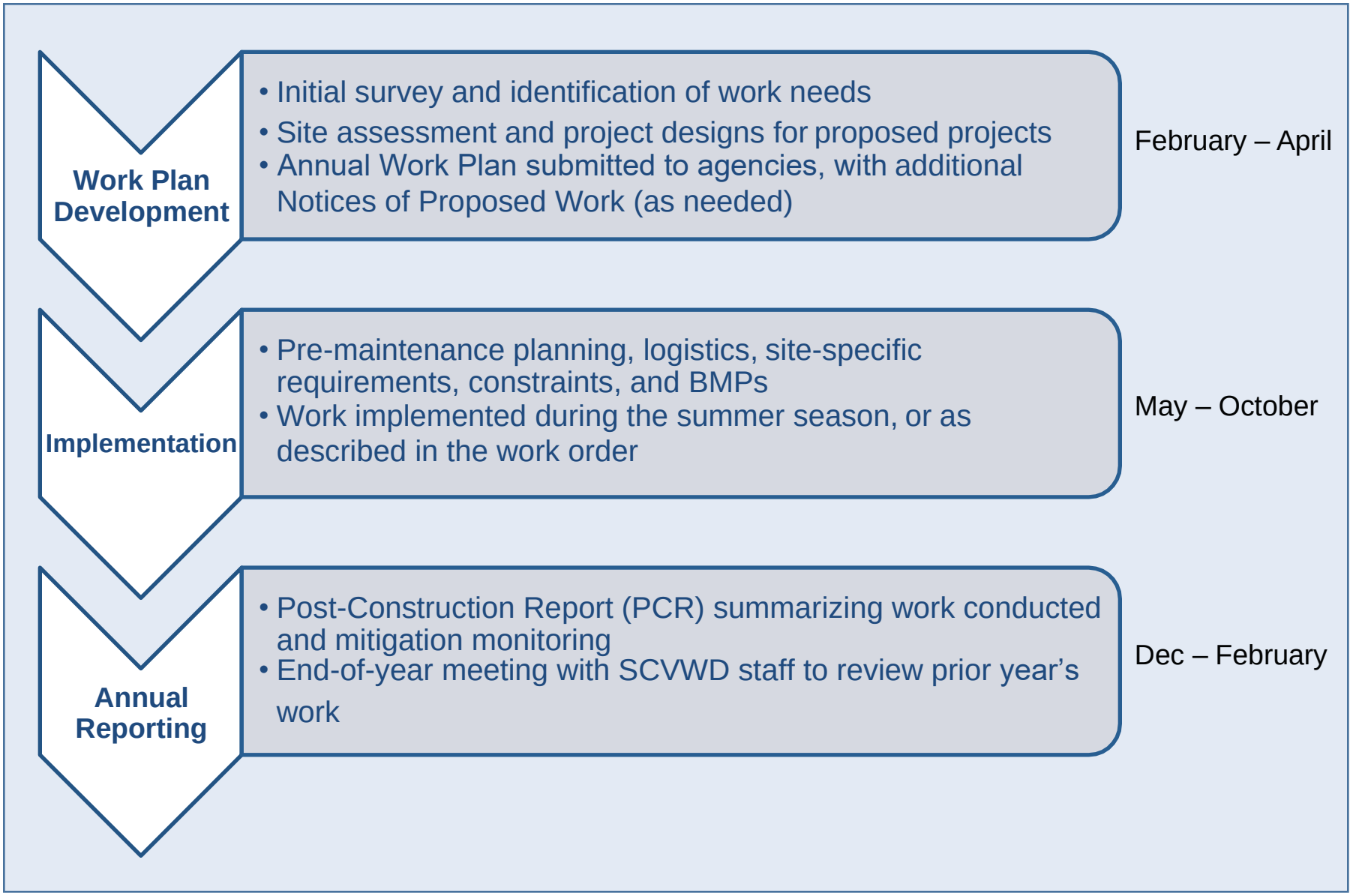

Horizon WATER and ENVIRONMENT

Figure 2)41
Annual SMP Work Sequence

Chapter 3
ENVIRONMENTAL SETTING AND IMPACT ANALYSIS

3.0 Introduction

3.0.1 Introduction to the Environmental Setting and Impact Analysis

Chapter 3, *Environmental Setting and Impact Analysis* of this DSEIR contains thirteen sections that describe the environmental resources and potential environmental impacts of the Proposed Project. Each one (Sections 3.1 through 3.13) contains the following information about its resource topic:

- a description of the environmental setting as well as background information about the resource topic, to help the reader understand the resources that could be affected by the Proposed Project;
- any regulations that may govern activities affecting the resource;
- a discussion of the criteria and thresholds used in determining the significance of the Proposed Project's environmental impacts;
- a discussion of the impacts of the Proposed Project on the resource, including the significance of each impact; and
- mitigation measures, including best management practices that would allow SCVWD to avoid, minimize, or compensate for any significant impacts.

This EIR has been prepared as a Subsequent EIR. Since the certification of the SMP Final EIR in 2002, substantial changes have been proposed to the SMP, and new information of substantial importance has developed. The project changes, changed circumstances, and new information have the potential to involve new or worsened significant environmental effects not evaluated in the 2002 SMP EIR. Under these circumstances, CEQA (Public Resources Code Sec. 21666) and the CEQA Guidelines (Sec. 15162) require that a Subsequent EIR be prepared.

Normally, when a Subsequent EIR is prepared, the environmental setting and baseline include the environmental impacts disclosed in the original EIR, and the Subsequent EIR discloses any additional impacts caused by project changes, changes in circumstances, or new information. Due to the extensive nature of the proposed changes to the existing SMP, it would have been technically very difficult to segregate the environmental effects of the proposed changes from the effects of the existing SMP, and to use a baseline of post-project environmental conditions through 2020 as disclosed in the 2002 SMP EIR.

Therefore, the project description for the SMP Update is comprehensive, and includes activities under both the existing SMP and the proposed changes to the SMP. This SEIR uses existing conditions at the time of the Notice of Preparation as the environmental setting and baseline, and analyzes the ~~2012-2020~~ impacts of the comprehensive SMP Update against this baseline. This conservative approach to the Subsequent EIR baseline and impact analysis scope represents an exception to established District CEQA practice due to the unique nature of the proposed SMP changes. It will not necessarily be employed in future District Subsequent EIRs for other projects in the absence of similar unique circumstances.

3.0.2 Sections Eliminated from Further Analysis

Four CEQA checklist resource areas have been eliminated from further analysis. Based on the nature and scope of Proposed Project activities, either no potential exists for significant impacts to these resources or they have been dismissed because the impacts associated with the topic have been addressed in other sections. A brief summary of the excluded resources is presented next. Also of note, two resource topics from the checklist are combined; public services and utilities, and service systems are discussed in Section 3.10, *Public Services and Utilities*.

Agricultural Resources

The Project Area covers a large portion of Santa Clara County (Figure 2-1), which contains a significant amount of land in agricultural uses. However, no activities under the Proposed Project would have an effect on these lands. Farmland and agricultural uses may be located near SMP Update maintenance sites; however, all Proposed Project activities would take place within flood protection channels and canals maintained by the SCVWD. These facilities do not contain lands designated or used for agriculture. In addition, these activities would be limited to maintenance and repair, and would not result in more intensive land development. No Prime Farmland, Unique Farmland, or Farmland of Statewide Importance, or lands under a Williamson Act contract would be converted under Proposed Project activities.

Geology and Soils

The Proposed Project would involve limited construction of permanent structures (e.g., culvert replacement), which could be subject to earthquake-related hazards, unstable soils, expansive soils, or other geotechnical hazards. However, these facilities would be designed to meet appropriate professional standards to avoid such hazards and, as a result, no significant impacts are anticipated to result. The Proposed Project does include some activities that have a potential to lead to topsoil erosion; erosion and siltation are addressed in Section 3.13, *Water Quality*. Furthermore, the Proposed Project would not involve the construction of any housing units requiring the use of septic tanks or other wastewater disposal systems.

Mineral Resources

Proposed Project activities would have no impact on the availability or use of a known, valuable mineral resource in Santa Clara County.

The Project Area includes a variety of streams, channels, and canals, used for flood protection. No aggregate mining facilities are currently operating within SCVWD-maintained facilities. Although mines or mineral resource areas may be located near Proposed Project work sites, none of these activities could directly affect those mineral production sites.

Sediment excavated under the SMP may be reused, with potential to offset demand for mineral resources such as aggregate. However, the total volume of dredged material created under the Proposed Project in any given year would be small (averaging approximately 46,500 cubic yards), and the amount available for reuse would be a fraction of this amount. This would not represent an appreciable fraction of the total aggregate resources used annually in the County.

Population and Housing

The Proposed Project does not involve the construction of permanent structures such as housing and employment centers, nor would it involve the creation of any new infrastructure. It only involves maintaining existing infrastructure. Thus, the Proposed Project would not induce growth either directly or indirectly. The Proposed Project would not displace any existing housing units or persons, as no habitable structures exist within the stream reaches where maintenance would occur.

Chapter 3.1

AESTHETICS

3.1 Aesthetics

3.1.1 Introduction

This section presents the regulatory setting, environmental setting, and potential impacts of the Proposed Project as related to aesthetics.

Visual Character and Viewshed

Both natural and artificial landscape features make up the character of a view. The area of the landscape that is visible from a particular location (e.g., an overlook) or series of points (e.g., a road or trail) is defined as a viewshed. Visual character is influenced by geologic, hydrologic, botanical, wildlife, recreational, and urban features. Urban features include aspects of landscape settlement and development, such as roads, utilities, structures, earthworks, and the results of other human activities. The perception of visual character can vary significantly among viewers, depending on their level of sensitivity and interest. Among sensitive viewers, perception can vary seasonally and even hourly as weather, light, shadow, and the elements that compose the viewshed change. Form, line, color, and texture are the basic components used to describe visual character and quality for most visual assessments (USFS 1974, FHWA 1983). Under this system, the appearance of the viewshed is described in terms of the dominance of each of these components.

Visual Quality

Visual quality is evaluated in this section using the well-established approach to visual analysis adopted by the Federal Highway Administration (Jones, et al. 1975, FHWA 1983), employing the concepts of vividness, intactness, and unity, as defined below:

- Vividness is the visual power or memorability of landscape components as they combine in striking or distinctive visual patterns.

- Intactness is the visual integrity of the natural and human-built landscape and its freedom from encroaching elements; this factor can be present in well-kept urban and rural landscapes, as well as in natural settings.

- Unity is the visual coherence and compositional harmony of the landscape considered as a whole; it frequently attests to the careful design of individual components in the artificial landscape.

Visual quality is evaluated based on the relative degree of vividness, intactness, and unity, as modified by its visual sensitivity, discussed next. High-quality views are highly vivid, relatively intact, and exhibit a high degree of visual unity. Low-quality views lack vividness, are not visually intact, and possess a low degree of visual unity.

Visual Sensitivity and Viewer Response

The measure of the quality of a view must be tempered by the overall sensitivity of the viewer. Viewer sensitivity is based on the visibility of resources in the viewshed, the

proximity of viewers to the visual resource, the elevation of viewers relative to the visual resource, the frequency and duration of viewing, the number of viewers, and the type and expectations of individuals and viewer groups.

The criteria for identifying the importance of views are related in part to the position of the viewer relative to the resource. To identify the importance of views of a resource, a viewshed may be divided into distance zones of foreground, middleground, and background. Generally, the closer a resource is to the viewer, the more dominant it is and the greater is its importance to the viewer. Although distance zones in viewsheds may vary between different geographic regions or types of terrain, a commonly used set of criteria identifies the foreground zone as 0.25–0.5 mile from the viewer, the middleground zone as extending from the foreground zone to approximately 3–5 miles from the viewer, and the background zone as extending from the middleground zone to infinity (USFS 1974).

Judgments of visual quality and viewer response must be made based in a regional frame of reference (USSCS 1978). The same type of visual resource in different geographic areas could have a different degree of visual quality and sensitivity in each setting. For example, a small hill may be a significant visual element in a flat landscape but have very little significance in mountainous terrain.

Generally, visual sensitivity is higher for views seen by people who are driving for pleasure; people engaging in recreational activities such as hiking, biking, or camping; and homeowners. Sensitivity tends to be lower for views seen by people driving to and from work or as part of their work (USFS 1974, USSCS 1978, FHWA 1983). Commuters and nonrecreational travelers have generally fleeting views and tend to focus on commute traffic, not on surrounding scenery; therefore, they are generally considered to have low visual sensitivity. Residential viewers typically have extended viewing periods and are concerned about changes in the views from their homes; therefore, they generally are considered to have moderate to high visual sensitivity. Viewers using recreation trails and areas, scenic highways, and scenic overlooks are usually assessed as having high visual sensitivity.

3.1.2 Regulatory Setting

Federal Plans, Policies, Regulations, and Laws

No federal plans, policies, regulations, or laws related to aesthetics are applicable to the Proposed Project.

State Plans, Policies, Regulations, and Laws

California Department of Transportation State Scenic Highway System

Maintenance of channels and canals under the Proposed Project that are near designated State Scenic Highways could affect views from these highways. The State Scenic Highways relevant to the Proposed Project are described in Section 3.1.3, *Environmental Setting*. The California Scenic Highway Program was established in 1963, under Sections 260 through 263 of the Streets and Highways Code. The Scenic Highway Program includes a list of highways that are either designated or eligible for designation as scenic highways (Caltrans 2010). For a State Scenic Highway-eligible roadway to be officially designated, the local jurisdiction in which it resides must adopt a scenic corridor protection program and apply to the California Department of Transportation (Caltrans) for scenic highway approval, identifying and defining the scenic corridor of the highway. Once approved by Caltrans, the local jurisdiction receives notification that the highway has been designated a State Scenic Highway. The local jurisdiction must then adopt ordinances to preserve the scenic quality of the corridor or document the regulations that already exist in various portions of local codes, creating the scenic corridor protection program. A scenic corridor is defined as land that is visible from the highway right of way and comprised primarily of scenic and natural features. Scenic corridor boundaries are determined by topography, vegetation, viewing distance, and/or jurisdictional lines. Officially designated State Scenic Highways are marked with a California poppy, the logo for the California Scenic Highway Program.

Regional and Local Plans, Policies, Regulations, and Ordinances

Applicable regional and local plans, policies, regulations, or ordinances related to aesthetics are presented in Appendix D.

3.1.3 Environmental Setting

Regional Character

Santa Clara County's major topographic features include the Baylands, the Santa Clara Valley, the Diablo Range to the east, and the Santa Cruz Mountains to the west. The Baylands are in the northwestern part of the county, adjacent to the waters of the southern San Francisco Bay, and consist mostly of salt evaporation ponds and areas of salt marsh and wetlands. The Santa Clara Valley is oriented in a northwest-southeast direction and is surrounded by rolling hills. The entire eastern half of the county is encompassed by the Diablo Range, which is covered by grasslands, brush and oak savannah. The lands of the Diablo Range typically have much less natural vegetative cover and far fewer stands of trees than the Santa Cruz Mountains (County of Santa Clara 2005). On the western side of the valley, the lower elevations of the Santa Cruz Mountains are characterized by rolling grasslands and oak-studded foothills. In the higher elevations of the Santa Cruz Mountains, the landscape transitions to mixed hardwoods and dense evergreen forests. (County of Santa Clara 1994)

Urbanization in the county has primarily occurred in the northern part of Santa Clara Valley. The majority of the county's residents (approximately 90 percent) and the county's cities (13 out of 15) are located in the North Valley. The remaining two cities, Gilroy and Morgan Hill, are located in the South Valley. Unlike the North Valley, the South Valley is predominantly rural, with the exception of Gilroy, Morgan Hill, and the small unincorporated community of San Martin. Low-density residential developments predominate in both valley areas and the surrounding foothills. (County of Santa Clara 1994)

Viewsheds

Views from the Santa Clara Valley floor are primarily of the foothills, ridges, and/or summits of the Santa Cruz Mountains and the Diablo Range. The topography and ridgelines within the county are highly variable. Along the eastern Diablo Range, prominent ridges run generally parallel to the Santa Clara Valley floor, from northwest to southeast. However, the Santa Cruz Mountains have a dominant ridge (the Summit Road area) that divides Santa Clara County from San Mateo and Santa Cruz Counties and intervening lower ridge areas. The lower ridge areas have other ridges or hillsides as their backdrop and can be oriented in many directions. This topography results in the Diablo Range being more visible from the valley than the Santa Cruz Mountains to the east. (County of Santa Clara 2005, 2006)

Public open spaces in the Project Area with scenic vistas include Almaden Quicksilver, Calero, Coyote Lake–Harvey Bear Ranch, Ed Levin, Mt. Madonna, Santa Teresa and Upper Stevens Creek county parks, and numerous smaller regional and local parks (County of Santa Clara 2010).

Scenic Highways and Corridors

One stretch of highway in the Project Area, a portion of the 10.9-mile stretch of State Route (SR) 9 from the Santa Cruz county line to the Los Gatos city limits, has been officially designated by Caltrans as a State Scenic Highway (Caltrans 2010). In the Project Area, this State Scenic Highway follows upper Saratoga Creek and crosses Wildcat Creek within the West Valley Watershed (Figure 2-3).

Six stretches of highway, either completely or partially within Santa Clara County, have been identified as eligible for designation as State Scenic Highways: SR 9 from SR 35 to SR 17 near Los Gatos; SR 17 from SR 1 near Santa Cruz to SR 9 near Los Gatos; SR 35 from SR 17 to SR 92, Interstate 280, and SR 1 in San Francisco; SR 152 from SR 156 near San Felipe to Interstate 5; SR 156 from SR 1 near Castroville to SR 152 northeast of Hollister; and Interstate 280 from SR 17 to Interstate 80 near First Street in San Francisco.

Santa Clara County also has designated an extensive network of roadways as Scenic Highways. This network includes unincorporated areas of the county, offering a diversity of viewsheds to travelers. State Highways 9, 17, 35, 101, 152, 156, 280, 680, and numerous local roads are identified as existing or proposed Scenic Highways (County of Santa Clara 1994, 2008).

In addition, some of the incorporated cities within Santa Clara County have identified scenic corridors and aesthetic resources. Overall, these are located around waterways and roadways that are identified by the County with views of the hillsides surrounding each city. Consistency of the Proposed Project with local policies to protect scenic corridors and aesthetic resources is discussed in Appendix D.

Where scenic highways and corridors intersect with SCVWD-maintained facilities, views from these highways and corridors could be affected by Proposed Project maintenance activities. In the Project Area, maintenance activities at tributary drainages to the Lexington Reservoir may be visible from SR 17 within the Guadalupe Watershed (Figure 2-4). Additionally, maintenance activities in upper Pacheco Creek from San Felipe to Pacheco Lake may be visible from SR 156 within the Pajaro Watershed (Figure 2-6).

Recreational Trails

The access roads that parallel most SMP-maintained channels and canals also provide creekside recreational (formal and informal) access. Some of these access roads are formalized as recreational trails, with signage and other amenities, such as benches. These trails provide an important recreational resource, particularly in the urban environment of San Jose. Creek-side trails typically are composed of consolidated earth or gravel, or are fully paved. Most of the Project Area channels and canals have some type of maintenance access road that also can serve as an informal creek-side trail or pathway. Although many of the access roads in the Project Area are not publicly accessible, many miles of roadways/trails are. Where accessible, these trails are used for a variety of recreational activities including walking, jogging, biking, dog-walking, and bird watching, and they provide aesthetic value for recreational users. See Section 3.11, *Recreation* for further discussion of recreational activities on creekside trails in the Project Area.

Aesthetic Quality at SMP Facilities

The creeks in Santa Clara County drain runoff from the Santa Cruz Mountains and the Diablo Range to the valley floor and, eventually, to either Monterey Bay or San Francisco Bay. Many of these water bodies flow through or near the county's urban areas, offering potential opportunities for views of creeks, stream channels, and canals, depending on the surrounding bank vegetation, access to or along the channels or canals, and other view-restricting factors. As described in Chapter 2, *Project Description*, the majority of the stream channels in the Project Area are "earthen," including both modified and unmodified channels. Other stream channels and canals in the Project Area consist of mixed or concrete channels.

The aesthetic quality of SCVWD-maintained facilities varies from reaches nearly devoid of vegetation to reaches supporting a full riparian canopy (see photos in Figure 3.1-1). Many of the creek reaches that would be maintained under the Proposed Project are located along public roadways or trails.

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SMP channels support riparian habitat and r paths (Los Gatos Creek)	Steep banks and instream ve n (San Francisquito Creek)
Concrete>lined channel (Guadalupe River)	d channel nearly devoid of riparian n (Sierra Creek)
Algae growth in stagnant summer low w condi ons (Pacheco Creek)	Tidal areas near San Francisco Bay (lower Coyote Creek)
View to riparian veget along Coyote Creek) from path on top of a levee	SCVWD channels include engineered structures and crossings

Horizon WATER and ENVIRONMENT

Figure 3.1+1
Representa ve Photos of SMP Channels

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In urbanized areas, such as within the City of San Jose, efforts would continue to be made to use creeks as the center focus of development, thus elevating the scenic value provided by creeks and their riparian vegetation. The City of San Jose, as described above, has strived to protect the aesthetic value of Guadalupe River and other local creeks by maintaining public multi-use trails along their banks. The public value of creeks in the Project Area is evidenced by the policies included in the local general plans, as listed in Appendix D.

Depending on their location, creeks and canals maintained under the SMP Update would be viewed by recreationalists, such as bicyclists, joggers, and horseback riders, as well as residents, people working in proximity to the creeks, other pedestrians, and motorists. Public access adjacent to the channels and canals maintained by the SMP Update may be provided by trails that would be located along the top of banks and at creek crossings.

SCVWD has been conducting maintenance activities similar to those proposed for the SMP Update for a number of years. Although the Proposed Project includes some new maintenance activities and the extension of some activities to portions of some streams not historically subject to those activities, overall, the baseline for analysis of impacts is a stream system that has already been altered by maintenance activities on an ongoing basis.

Viewer Groups and Viewer Responses

Viewer groups in the vicinity of the Project Area and their sensitivity to visual changes in the area are characterized below. Viewer groups who have visual access to SCVWD-maintained facilities were divided into the categories of recreational users, residents, workers, and motorists.

Recreational Users

Recreational use in the Project Area includes a variety of activities, such as walking, jogging, biking, dog-walking, and bird watching. Many hiking trails within county parks, such as Almaden Quicksilver, Sanborn-Skyline, Rancho San Antonio, Joseph D. Grant, Calero, Mt. Madonna, Coyote Lake–Harvey Bear Ranch, Ed Levin, and Anderson Lake, provide views of the Santa Clara Valley, the Bay, and/or the surrounding mountain ranges (County of Santa Clara 1995, 2010). Viewer sensitivity is moderately high among recreational users because they highly value the natural environment, appreciate the visual experience, and are sensitive to changes in views.

Residents

Residents are individuals whose homes are in proximity to SCVWD-maintained facilities in the Project Area. Similar to recreational users, viewer sensitivity is moderately high among residents because they highly value their local visual resources, appreciate the visual experience, and are fairly sensitive to changes in views.

Workers

Workers are those whose place of employment is near SCVWD-maintained facilities in the Project Area, or who may come into contact with such facilities as part of their work activities (e.g., delivery persons). Viewer sensitivity is moderate among workers because they generally are not highly focused on the visual resources surrounding their workplace and are less sensitive to changes in views.

Motorists

Motorists use roadways at varying speeds; normal highway and roadway speeds differ based on the design speed of the roadway, traffic volumes, traveler's familiarity with the route, and roadway conditions (e.g., presence/absence of rain). Single views typically are of short duration, except on straighter stretches where views last slightly longer. Motorists who frequently travel the same routes generally possess low to moderate visual sensitivity to their surroundings. The passing landscape becomes familiar to them, and their attention typically is not focused on passing views but on the roadway, roadway signs, and surrounding traffic. Motorists who travel local routes for sight-seeing purposes generally possess a higher visual sensitivity to their surroundings because they are likely to respond to the natural environment with higher regard and as a holistic visual experience.

Viewer sensitivity is expected to be moderately low for most roadway travelers anticipated in the Project Area. The passing viewshed would become familiar to frequent viewers; furthermore, at standard roadway speeds, views would be of short duration and roadway users would be only fleetingly aware of surrounding traffic, road signs, their immediate surroundings within the automobile, and other visual features.

3.1.4 Impact Analysis

Methodology

This section describes the methods used to determine the Proposed Project's impacts and lists the thresholds used to conclude whether an impact would be significant.

The methodology used to assess possible visual resource impacts that could be caused by the Proposed Project includes the following:

1. Objectively identify visual features (visual resources) in the Project Area.
2. Assess the character and quality of those resources relative to the overall regional visual character.
3. Identify the importance to people or their sensitivity regarding views of visual resources in the viewshed.
4. Characterize the nature of changes to visual resources resulting from implementing the Proposed Project.
5. Assess the significance of these changes in light of items 1–4.

By establishing the baseline (existing) conditions, changes resulting from activities under the Proposed Project or other changes to the viewshed can be objectively evaluated for their degree of impact. The degree of impact depends both on the magnitude of change in the visual resource (i.e., visual character and quality) and on viewers' responses to and concern for those changes. This general process is similar for all established federal procedures of visual assessment (Smardon et al. 1986) and represents a suitable methodology of visual assessment for the Proposed Project.

Implementation of the Proposed Project was evaluated based on the potential to impact the following viewer groups, which are most likely to be affected by Proposed Project activities: recreational users (pedestrians and cyclists), residents, workers, and motorists (drivers and passengers in cars or motorcycles).

Criteria for Determining Significance

For the purposes of this analysis, the Proposed Project would result in a significant impact on aesthetics if it would:

A. have a substantial adverse effect on a scenic vista or designated scenic highway;

B. substantially damage publicly visible scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings;

C. substantially degrade the existing visual character or quality of the site and its surroundings; or

D. create a new source of substantial light or glare that would adversely affect day or nighttime views in the area.

Environmental Impacts

Impact AES-1: Alteration to a Scenic Vista (Significance Criteria A, B; Less than Significant)

Scenic viewpoints within the Project Area are generally located at relatively high elevations along ridgelines within public open space areas and are typically viewed by recreational hikers and bicyclists, and motorists. The Proposed Project maintenance activities would occur within creek corridors or in canals at lower elevations, mostly on the valley floor. No maintenance activities would be conducted above the 1,000-foot elevation contour, where the majority of scenic vista points in the county are located.

The distance from publicly accessible ridgeline trails and scenic vistas to creeks and canals in the valley is generally 2 to 5 miles. Because of the extent of the viewing distance and considering that many of the maintenance sites would be obscured from view by vegetation, it is unlikely that Proposed Project maintenance activities would be highly noticeable from scenic vistas. Maintenance vehicles and maintenance workers would be indistinguishable from other vehicles at this distance.

Sediment Removal

Removal of sediment from SCVWD channels and facilities would result in temporary presence of vehicles, machinery, and personnel at sites during the maintenance period. Once work is completed, the channel itself would be visibly cleared of sediment. However, such changes would not be noticeable from scenic vista points for the reasons described above.

Vegetation Maintenance

Proposed vegetation maintenance activities, such as tree removal and limbing, could potentially alter the character of riparian corridors within the Project Area. In general, this alteration would not be highly noticeable when viewed from a scenic viewpoint.

Management of Animal Conflicts/Minor Maintenance/Bank Stabilization

As described in the SMP Manual (Appendix A), management of animal conflicts would involve small-scale activities (e.g., use of traps, filling of burrows), which would not be visible from a scenic vista. Similarly, minor maintenance activities (e.g., graffiti removal, small-scale sediment removal) would have limited potential to impact scenic vistas. Bank stabilization projects would result in sections of visibly altered banks with new materials used to conduct repairs. Given the few number of bank stabilization projects that are likely to occur per year (averaging approximately 1 mile in total), adverse effects on scenic vistas would be minimal.

Canal Maintenance

Because routine canal maintenance activities would include all general work activities, effects would be the same as described above for other routine maintenance work.

Applicable Best Management Practices

The following BMPs implemented as part of the SMP Update would help prevent maintenance activities from substantially degrading a scenic vista. Descriptions of each BMP are provided in Chapter 2, *Project Description*.

BMP GEN-19: Work Site Housekeeping
BMP REVEG-1: Seeding
BMP REVEG-2: Planting Material

Conclusion

Given the relatively minor effect that Proposed Project activities would have on views from scenic vistas, this impact would be less than significant and would not require mitigation.

Mitigation Measures: No mitigation is required.

Impact AES-2: Alteration to Scenic Resources Viewed from a State or County-designated Scenic Highway (Significance Criterion A; Less than Significant)

As described above in Section 3.1.3, *Environmental Setting*, one stretch of highway within the Project Area is officially designated by Caltrans as a State Scenic Highway, and Santa Clara County has designated a number of roads within the Project Area as scenic highways. These scenic highways generally are located along waterways and provide views of the hills surrounding the county.

Maintenance activities in areas where creeks or canals are close to scenic highways could temporarily (but in some cases, repeatedly) disrupt views. However, scenic highways in the Project Area are utilized by motorists traveling at highway speeds. Motorists traveling on designated scenic highways generally would have only fleeting views of maintenance activities and post-maintenance alterations to stream channels or canals.

Vegetation Maintenance

The pruning and removal (physically or using herbicide treatment) of vegetation could disrupt views along scenic highways or corridors. Although vegetation management would occur in multiple locations at any given time, the majority of vegetation maintenance activities would be done infrequently at any particular location, allowing for vegetation to grow back after vegetation maintenance activities had been conducted. Thus for the majority of vegetation maintenance activities, impacts would be less than significant.

In some areas, herbicide treatment would be done repeatedly to maintain the location in a permanently denuded state. Though limited, this type of treatment would alter scenic resources of the area over the long term, and may be located within the viewpoint of a scenic highway or corridor. However, maintaining areas in this state could have a beneficial effect by promoting consistency (as opposed to alternating views of cleared areas and regrowth stages) and minimizing views of overgrowth. Overall, impacts from repeated herbicide treatment would be expected to have a slightly greater potential for impacts.

Other Maintenance Activities

The remainder of maintenance activities (sediment removal, bank stabilization, management of animal conflicts, canal maintenance, and minor maintenance) would occur in multiple locations, but would generally be done infrequently at any one location and would have only temporary impacts. Even in the case of repeat activities (e.g., rodent control), the appearance of these maintenance activities and post-maintenance alterations would not leave a lasting impression on the overall view from the window of a car traveling at highway speeds.

Applicable Best Management Practices

The following BMPs would be implemented as part of the SMP Update to prevent maintenance activities from substantially degrading scenic resources along a waterway or altering views of surrounding hillsides. Descriptions of each BMP are provided in Chapter 2, *Project Description*.

BMP GEN-19: Work Site Housekeeping
BMP REVEG-1: Seeding
BMP REVEG-2: Planting Material

Conclusion

The impact on State or County-designated scenic highways resulting from the Proposed Project would be less than significant and would not require mitigation.

Mitigation Measures: No mitigation is required.

Impact AES-3: Temporary Alteration of Visual Character or Quality from Maintenance Activities (Significance Criteria B, C; Significant and Unavoidable)

Many miles of creekside recreational trails currently exist or are planned within the Project Area. These creekside trails are utilized by recreational users and commuters, and are located in residential, commercial, and open space areas.

Short-term maintenance activities including vegetation management, sediment removal, and bank protection could result in a temporary degradation of visual quality. These impacts are described below.

Vegetation Management

During vegetation management activities, a temporary visual impact would occur from the presence of maintenance crews and equipment near channels. Vegetation management could degrade the visual character of creeks and canals if it were to remove major stands of large vegetation. Invasive plant removal activities may alter a densely vegetated area to a partially vegetated or bare area until newly planted vegetation grow in. Herbicide activities also could alter the visual character of a site as targeted vegetation was destroyed. In addition, impacts from tree removal in areas where existing trees were sparse and where replanting was infeasible could be substantial.

Sediment Removal and Bank Stabilization

For sediment removal and bank stabilization activities, a temporary visual impact also would occur from maintenance crews and equipment near and in channels. Both sediment removal and bank stabilization projects could result in areas that would be temporarily de-vegetated, which on some creeks in the system would be different from areas surrounding the site, although bank stabilization sites would include a revegetation component, where feasible (see Appendix C, which describes the revegetation approach for bank stabilization activities).

Viewer response to altered canal, channel, and riparian corridors after maintenance activities may vary. Commuters on creekside trails who passed by the site on a daily basis could react to the changed conditions. However, such changed conditions would be temporary (because vegetation would grow back over time) and would occur at isolated locations. Likewise, sediment removal projects that would remove silt, vegetation and other blockages may allow the creek to function more naturally, resulting in an aesthetic benefit.

Management of Animal Conflicts

Other than the temporary presence of maintenance personnel and vehicles, activities proposed for animal conflict management would not involve actions which could result in the temporary alteration of visual character or quality. Bait traps, if left on-site, would be hidden or otherwise made inconspicuous to prevent vandalism and theft.

Minor Maintenance

Minor maintenance activities generally would be small scale (e.g., small amounts of sediment removal, removal of debris), and would have limited potential to impact visual quality. However, the installation/maintenance of landscape sites would result in a visual improvement at the time of installation.

Canal Maintenance

Because routine canal maintenance activities would include all general work activities, effects would be the same as described above for other routine maintenance work.

Applicable Best Management Practices

The following BMPs would be implemented as part of Proposed Project activities to address any temporary impacts on aesthetics during maintenance:

BMP GEN-19: Work Site Housekeeping
BMP REVEG-1: Seeding
BMP REVEG-2: Planting Material

Conclusion

As discussed above, the majority of activities would have less-than-significant impacts on temporary alterations of visual character or quality and would not require mitigation. Implementation of Mitigation Measures BIO-1, BIO-2, and BIO-7 would further aid in reducing these impacts, where implementation of such mitigation would result in revegetation activities or tree planting being conducted on site.

Depending on viewer sensitivity, tree removal in areas where revegetation was infeasible could result in a significant impact. No other feasible mitigation measures have been identified. Therefore, for the purposes of this DSEIR, temporary alterations on visual character or quality from tree removal without on-site tree replacement or replanting would be considered a significant and unavoidable impact.

Mitigation Measure BIO-1: Implement Compensatory Mitigation for Wetlands and Other Waters

See Impact BIO-1 in Section 3.3, *Biology Resources*.

Mitigation Measure BIO-2: Implement Compensatory Mitigation for Woody Riparian Vegetation

See Impact BIO-1 in Section 3.3, *Biology Resources*.

Mitigation Measure BIO-7: Tree Replacement

See Impact BIO-7 in Section 3.3, *Biology Resources*.

Impact AES-4: Permanent Alteration of Visual Character or Quality from Maintenance Activities (Significance Criterion C; Significant and Unavoidable)

This impact discussion focuses on the long-term aesthetic effects of the Proposed Project. Overall, the long-term effect from maintenance activities would improve the visual character and quality of the Project Area.

Sediment Removal and Bank Stabilization

Removal of sediment from SCVWD channels and facilities would remove sediment, vegetation, and other blockages that would allow waterways to function more naturally, and thus resulting in an aesthetic benefit. Similarly, stabilization and repair of eroding banks would reduce sediment loss and in-channel build-up. Although the use of certain materials (i.e., rock, riprap) to repair banks could appear visually different, on-site revegetation (as described in Appendix C) would minimize long-term visual impacts and make them less than significant.

Vegetation Management

Overall, the removal of invasive plant species and revegetation with native species would improve the long-term aesthetic value of the riparian corridors. However, as discussed in Impact AES-3, proposed vegetation maintenance activities, such as tree removal, could potentially alter the character of riparian corridors in the Project Area. As discussed in Impact AES-3, this alteration would generally be less than significant, especially where replanting or revegetation would occur. As described in Section 3.3, *Biological Resources*, mitigation for larger-sized tree removals would be required, which would minimize permanent visual alterations. However, the impact on visual quality or character could be significant when tree removal was conducted in areas where existing trees were sparse and where replanting were infeasible.

Management of Animal Conflicts

Long-term effects from the management of animal conflicts could benefit the visual character or quality of treated areas. By discouraging damage caused by animal activity (i.e., burrowing), the integrity of SCVWD facilities would be preserved and visual damage would be minimized. Therefore, the permanent impacts from management of animal conflicts under the Proposed Project would be beneficial.

Minor Maintenance

Minor maintenance activities, including installation/maintenance of landscape sites, debris removal, fence maintenance, and graffiti removal, would improve the visual quality and character of channels. Therefore, permanent effects on visual quality and character from these activities would be beneficial.

Canal Maintenance

Because routine canal maintenance activities would include all general work activities, effects would be the same as described above for other routine maintenance work.

Applicable Best Management Practices

SCVWD would implement the following BMPs as part of maintenance activities:

BMP GEN-19: Work Site Housekeeping
BMP SED-3: Restore Channel Features
BMP REVEG-1: Seeding
BMP REVEG-2: Planting Material

The good housekeeping practices would be followed at all maintenance sites and the other BMPs would provide for revegetation activities to be implemented shortly after completing vegetation management, sediment removal, or bank stabilization activities that would remove vegetation. Furthermore, these BMPs would prevent maintenance activities from degrading scenic resources, and instead would improve the aesthetic character of the sites affected by maintenance activities.

Conclusion

As discussed above, most activities of Proposed Project would have a less-than-significant or beneficial impact on long-term aesthetic quality and would not require mitigation. Implementation of Mitigation Measures BIO-1, BIO-2 and BIO-7 would further aid in reducing these impacts, where implementation of such mitigation would result in revegetation activities or tree planting being conducted on site.

However, in some instances permanent impacts on visual quality or character resulting from tree removal could be significant where replanting was not possible. No other feasible mitigation measures have been identified. Therefore, for the purposes of this DSEIR, permanent alterations on visual character or quality from tree removal in areas where replanting was infeasible would be considered a significant and unavoidable impact.

Mitigation Measure BIO-1 Implement Compensatory Mitigation for Wetlands and Other Waters

See Impact BIO-1 in Section 3.3, *Biology Resources*.

Mitigation Measure BIO-2 Implement Compensatory Mitigation for Woody Riparian Vegetation

See Impact BIO-1 in Section 3.3, *Biology Resources*.

Mitigation Measure BIO-7 Tree Replacement

See Impact BIO-7 in Section 3.3, *Biology Resources*.

Impact AES-5: Substantial Alteration to Day or Nighttime Views resulting from Additional Light or Glare (Significance Criterion D; No Impact)

Proposed Project maintenance activities would be conducted during daylight hours only. No nighttime lighting would be utilized for maintenance activities. The Proposed Project would not involve construction of new facilities or modifications to existing facilities that would result in new reflective surfaces or installation of lighting. No impact would occur.

Mitigation Measures: No mitigation is required.

Impact AES-6: Impacts on Aesthetics Associated with Sediment Disposal/Reuse (Significance Criterion C; Less than Significant)

Sediment removed from SCVWD-maintained channels and canals would be disposed or reused in various ways, depending on the quality of the excavated material, which may include but would not be limited to temporary stockpiling before reuse, off-site restoration or enhancement of ecologic function, or disposal at a landfill.

Temporary Stockpiling

When necessary, temporary stockpiling of the sediment would occur within staging areas associated with the work site or at other SCVWD-owned properties. The stockpiles could be located near residential and recreational viewers who may be sensitive to changes in the visual character of the site. However, impacts from stockpiling would be temporary and therefore less than significant.

Off-Site Reuse by SCVWD

Off-site reuse to support ecologic functions, such as tidal wetland habitat, would be likely to have similar impacts as described under Impact AES-3. Such activities would utilize sediment in a manner that would enhance the natural aesthetics of tidal wetland areas, and thus would be considered beneficial.

Disposal at a Landfill

If off-site reuse locations were unavailable or if the sediment was considered hazardous, it would be taken to a general waste or hazardous waste landfill. The amount of sediment generated from maintenance activities and disposed at a landfill would not exceed any landfill's permitted capacities. Often, sediment materials are used at landfills as a 'cover' to cap accumulated garbage. This use of disposed sediment would therefore improve the aesthetic quality of the landfill. Impacts from disposal at a landfill would be considered beneficial.

Applicable Best Management Practices

SCVWD would implement the following BMP as part of maintenance activities to screen any stockpiled sediment from public view, to the extent practical, for the duration that the sediment was stored:

BMP GEN-21: Staging and Stockpiling of Materials

Conclusion

The aesthetic impacts of sediment reuse/disposal would be less-than-significant and would not require mitigation.

Mitigation Measures: No mitigation is required.

Chapter 3.2

AIR QUALITY

3.2 Air Quality

3.2.1 Introduction

This section presents the regulatory setting, environmental setting, and potential impacts of the Proposed Project related to air quality.

Data sources used in the preparation of this section include state and federal regulations and reference materials from the Bay Area Air Quality Management District (BAAQMD).

Specific to this section is the term "sensitive receptors," meaning those who are particularly susceptible to the adverse effects of air pollution. These include children, the elderly, and people with illnesses. Examples include schools, nursing homes, hospitals, and residential areas. Air pollution can cause adverse health effects in humans, including aggravating asthma conditions and other respiratory problems (BAAQMD 2010). Sensitive receptors adjacent to stream reaches in the Project Area are numerous, and include people in residential areas, schools, elder care facilities, and hospitals.

3.2.2 Regulatory Setting

Federal Plans, Policies, Regulations, and Laws

Clean Air Act

The U.S. Environmental Protection Agency (USEPA) carries out the provisions of the Clean Air Act (CAA), originally passed in 1963 and amended six times, most recently in 1990. USEPA implements programs under the CAA that focus on reducing ambient air pollutant concentrations, reducing emissions of toxic pollutants, and phasing out production and use of chemicals that destroy stratospheric ozone. USEPA sets ambient air limits, the National Ambient Air Quality Standards (NAAQS) for six criteria pollutants: particulate matter, carbon monoxide, nitrogen oxides, sulfur oxides, ground-level ozone, and lead. The NAAQS are presented in Table 3.2-1. Primary standards are set for protection of human health and secondary standards are set for environmental protection. Areas which meet the primary standards are considered in "attainment" while areas with air quality not meeting the primary standards are in "non-attainment."

Of the six criteria pollutants, particulate matter and ground-level ozone pose the most widespread threat to human health. Particle pollution poses the greatest threat to sensitive receptors including children, the elderly, and asthmatics, as it impairs lung function. Particle pollution includes very fine soot and dust. Sources of particulate matter include: ground-disturbing activities (such as construction grading and excavation); motor vehicles; power generation activities; industrial operations; burning of fuels (such as wood, oil, and coal); dust from unpaved roads; and crushing and grinding operations. Particle pollution can be carried by the wind and impair air quality far from its source. To reduce particle levels, USEPA regulates emissions from motor vehicles and point sources.

Table 3.2-1. State and Federal Ambient Air Quality Standards

Contaminant	Averaging Time	State Standards[1,3]	Primary Federal Standards[2,3,5]	Secondary Federal Standards[2,3,6]
Ozone	1-hour	0.09 ppm (180 μg/m^3)	-	-
	8-hour	0.070 ppm (137 μg/m^3, see note 4)	0.075 ppm (147 μg/m^3)	Same as primary standard
Respirable Particulate Matter (PM_{10})	24-hour	50 μg/m^3	150 μg/m^3	Same as primary standard
	Annual arithmetic mean	20 μg/m^3	-	-
Fine Particulate Matter ($PM_{2.5}$)	24-hour	-	35 μg/m^3	Same as primary standard
	Annual arithmetic mean	12 μg/m^3	15 μg/m^3	Same as primary standard
Carbon Monoxide	8-hour	9.0 ppm	9 ppm (10 mg/m^3)	None
	1-hour	20 ppm	35 ppm (40 mg/m^3)	None
Nitrogen dioxide	Annual arithmetic mean	0.030 ppm (57 μg/m^3)	0.053 ppm (100 μg/m^3) [8]	Same as primary standard
	1-hour	0.18 ppm (339 μg/m^3)	0.100 ppm (188 μg/m^3) [8]	
Sulfur dioxide	24-hour	0.04 ppm (105 μg/m^3)	0.14 ppm (365 μg/m^3)	-
	3-hour	-	-	0.5 ppm (1,300 μg/m^3) [9]
	1-hour	0.25 ppm (655 μg/m^3)	75 ppb (196 μg/m^3) [9]	-
Lead[10]	30-day average	1.5 μg/m^3	-	-
	Calendar quarter	-	1.5 μg/m^3	Same as primary standard
	Rolling 3-month average[11]	-	0.15 μg/m^3	Same as primary standard
Visibility reducing particles	8-hour	See note 7	-	-
Sulfates	24-hour	25 μg/m^3	-	-
Hydrogen Sulfide	1-hour	0.03 ppm (42 μg/m^3)	-	-
Vinyl Chloride[10]	24-hour	0.01 ppm (26 μg/m^3)	-	-

ppm – parts per million by volume
μg/m^3 – micrograms per cubic meter
PM_{10} – particulate matter less than 10 microns in diameter
$PM_{2.5}$ – particulate matter less than 2.5 microns in diameter

Table 3.2-1. State and Federal Ambient Air Quality Standards

Notes:

1. California standards for ozone, carbon monoxide (except Lake Tahoe), sulfur dioxide (1 and 24 hour), nitrogen dioxide, suspended particulate matter—PM10, PM2.5, and visibility reducing particles, are values that are not to be exceeded. All others are not to be equaled or exceeded. California ambient air quality standards are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.
2. National standards (other than ozone, particulate matter, and those based on annual averages or annual arithmetic mean) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest eight hour concentration in a year, averaged over three years, is equal to or less than the standard. For PM10, the 24 hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 $\mu g/m^3$ is equal to or less than one. For PM2.5, the 24 hour standard is attained when 98 percent of the daily concentrations, averaged over three years, are equal to or less than the standard. Contact U.S. EPA for further clarification and current federal policies.
3. Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based upon a reference temperature of 25°C and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.
4. Any equivalent procedure which can be shown to the satisfaction of the California Air Resources Board (CARB) to give equivalent results at or near the level of the air quality standard may be used.
5. National Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health.
6. National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.
7. Extinction coefficient of 0.23 per kilometer—visibility of ten miles or more (0.07—30 miles or more for Lake Tahoe) due to particles when relative humidity is less than 70 percent. Method: Beta Attenuation and Transmittance through Filter Tape.
8. To attain this standard, the 3-year average of the 98th percentile of the daily maximum 1-hour average at each monitor within an area must not exceed 0.100 ppm (effective January 22, 2010). Note that the USEPA standards are in units of parts per billion (ppb). California standards are in units of parts per million (ppm). To directly compare the national standards to the California standards the units can be converted from ppb to ppm. In this case, the national standards of 53 ppb and 100 ppb are identical to 0.053 ppm and 0.100 ppm, respectively.
9. On June 2, 2010, USEPA established a new 1-hour SO2 standard, effective August 23, 2010, which is based on the 3-year average of the annual 99th percentile of 1-hour daily maximum concentrations. USEPA also proposed a new automated Federal Reference Method (FRM) using ultraviolet technology, but will retain the older pararosaniline methods until the new FRM have adequately permeated state monitoring networks. USEPA also revoked both the existing 24-hour SO2 standard of 0.14 ppm and the annual primary SO2 standard of 0.030 ppm, effective August 23, 2010. The secondary SO2 standard was not revised at that time; however, the secondary standard is undergoing a separate review by USEPA. Note that the new standard is in units of parts per billion (ppb). California standards are in units of parts per million (ppm). To directly compare the new primary national standard to the California standard, the units can be converted to ppm. In this case, the national standard of 75 ppb is identical to 0.075 ppm.
10. CARB has identified lead and vinyl chloride as "toxic air contaminants" with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.
11. National lead standard, rolling 3-month average: final rule signed October 15, 2008.

Source: CARB 2010

Ground-level ozone is the primary component of smog. Ozone is formed from the interaction of reactive organic gases (ROG) and nitrogen oxides (NOx). ROG is emitted by motor vehicles, industrial activities, and consumer products (such as paints, inks, and adhesives). NOx is formed during the burning of fossil fuels such as gasoline, diesel fuel, coal, and oil. Weather and topography influence the formation and location of ground-level ozone. Hot temperatures spur the reaction between volatile organic compounds and nitrogen oxides to form ozone. Ground-level ozone settles into valleys when winds are calm and temperatures are warm. Sensitive receptors to ozone are the same as those listed for particulate matter, with the addition of forests and agricultural crops.

State Plans, Policies, Regulations, and Laws

California Air Resources Board

The California Air Resources Board (CARB) was established in 1967. CARB has set California Ambient Air Quality Standards (CAAQSs), presented in Table 3.2-1, that are more stringent than the NAAQS for most contaminants. These include standards for additional contaminants not covered in the NAAQS, including visibility reducing particles, sulfates, hydrogen sulfide, and vinyl chloride. The California Clean Air Act was passed in 1988 and requires non-attainment areas to achieve and maintain the CAAQSs by the earliest time practicable, and local air districts to develop attainment plans for state standards.

CARB regulates motor vehicle emissions in the state, while local air quality management district's permit stationary sources.

Regional and Local Plans, Policies, Regulations, and Ordinances

CARB has designated 15 air basins in the state. Thirty-five local air quality management districts are responsible for attainment and permitting in each basin and subbasin area. Santa Clara County is located in the San Francisco Bay Area Air Basin. The BAAQMD oversees planning and permitting in the nine-county Bay Area, including Santa Clara County.

BAAQMD 2010 Clean Air Plan/BAAQMD CEQA Guidelines

The BAAQMD adopted a new clean air plan (the Bay Area 2010 Clean Air Plan) in September 2010. The purposes of the Bay Area 2010 Clean Air Plan are to: update the Bay Area 2005 Ozone Strategy in accordance with the requirements of the California Clean Air Act to implement "all feasible measures" to reduce ozone; provide a control strategy to reduce ozone, particulate matter (PM), and air toxics in a single, integrated plan; review progress in improving air quality in recent years; and establish emission control measures to be adopted or implemented in the 2010–2012 timeframe (BAAQMD 2010).

The BAAQMD published its latest version of the State CEQA Guidelines in May 2011, to aid assessment of air quality impacts. The guidelines address evaluation of air quality impacts and their significance, and development of mitigation measures for significant impacts. The guidelines focus on criteria air pollutant, toxic air contaminant, and odor emissions generated from projects.

3.2.3 Environmental Setting

Climate and Topography

Climate and topography dictate the potential for air pollution to build up or concentrate in geographic areas. Wind speed, inversions, atmospheric stability, solar radiation, and terrain all influence air pollution potential. The actual air quality is a function of the air pollution potential and the existing emissions at any given time.

Wind speed affects air quality because faster winds carry pollutants away from the source. Low wind speeds allow more pollutants to be emitted into the air mass per unit of time, leading to a buildup of pollutant concentration. Similarly, inversions influence the mass of air available for dilution by vertically limiting the distance pollutants can travel. An inversion occurs when the typical atmospheric condition of "temperature decreases with elevation increases" is reversed, or "inversed." Inversions may result in a layer of warmer air resting over a layer of cooler air. The denser cooler air is trapped below the less dense warm air. In this inversion situation, pollutants emitted are trapped beneath the warmer air aloft within the cooler air lower to the ground. This situation, in combination with reduced circulation, reduces opportunities for mixing and dispersion, potentially leading to higher pollutant concentrations and poorer air quality. Inversions in the Bay Area may limit the pollutant mixing depth of the lower air mass to as little as 50 to 100 meters above the ground surface. In the Bay Area, inversions can occur in the winter under conditions of cold, clear nights, with damp ground and little wind. Inversions also happen under warmer weather conditions when the fog systems keep ground temperatures cooler than the air above them. (BAAQMD 2011)

Atmospheric stability also influences the ability of pollutants to move vertically. Stability is defined as the atmosphere's resistance to vertical motions (BAAQMD 2011). The more stable the air, the slower the mixing of pollutants into the air mass. Stability is dependent on the temperature gradient with elevation. A stronger standard temperature gradient (with temperatures decreasing with elevation increases) increases atmospheric instability and mixing. Atmospheric stability can cause reduced pollutant mixing and, therefore, increased air pollution potential.

Solar radiation is necessary for formation of ozone in the atmosphere. Ultraviolet sunlight and warm temperatures catalyze the chemical reaction between reactive organic gases and nitrogen oxides that form ozone. The frequent hot, sunny days in the Bay Area in the summer months promote ozone air pollution, particularly in the inland valleys where temperatures are warmest. Insufficient ultraviolet light and warmth in the winter reduce the likelihood of forming ozone. (BAAQMD 2011)

Topography influences air pollution principally through wind and circulation patterns. The lee side of mountains may be sheltered from the predominant winds, reducing turbulence and downward transport. Elevated terrains can create temperature and density driven circulations, with up-valley wind flows during daytime heating and down-valley flows during nighttime cooling (BAAQMD 2011). In the Bay Area, typical on-shore regional wind patterns from the west and northwest can be reversed by seasonal off-shore flows,

generating northeasterly and easterly winds. Winter cyclonic storms may bring southerly winds.

San Francisco Bay Air Subbasins

The BAAQMD divides the San Francisco Bay Area Air Basin into subbasins with distinct climate and topography. Two air subbasins occupy Santa Clara County—the Peninsula and the Santa Clara Valley subbasins. The peninsula region of the Bay Area extends from the area northwest of San Jose to the Golden Gate, with the Santa Cruz Mountains extending up the center of the peninsula and terminating in South San Francisco. Small coastal towns on the west side of the mountains experience a high incidence of cool, foggy weather in the summer resulting from coastal ocean upwelling and northwest winds. Larger cities in the southeastern area of the peninsula, on the east side of the mountain range, experience warmer temperatures and few foggy days because the marine layer is blocked by the mountains to the west. Annual average wind speeds range from 5 to 10 miles per hour throughout the peninsula. On the east side of the mountains, the winds are generally in a westerly pattern, although the wind patterns are influenced by local topographic features. The blocking effect of the Santa Cruz Mountains results in higher temperatures in the eastern areas, with summertime maximum temperatures at Redwood City, representing the eastern peninsula, in the low 80s. The average minimum temperature in Redwood City is 40˚F in the winter and 52–54˚F in the summer. Air pollution potential is highest along the southeastern portion of the peninsula because this area is most protected from the high winds and fog of the marine layer, the emission density is relatively high, and pollutant transport from upwind sites is possible. (BAAQMD 2009b)

The Santa Clara Valley subregion is bounded by the Santa Cruz Mountains to the west, the Diablo Range to the east, the San Francisco Bay to the north, and the convergence of the Gabilan Range and the Diablo Range to the south. The terrain of the Santa Clara Valley greatly influences the wind patterns and results in a prevailing flow roughly parallel to the Valley's northwest-southeast axis, with a north-northwesterly sea breeze extending up the valley during the afternoon and early evening and a light south-southeasterly drainage flow occurring during the late evening and early morning. Speeds are greatest in the spring and summer. The strongest winds generally occur during summer afternoon and evenings, although strong winds typically only occur during winter storms. In the summer, temperatures are warm during the day, with mostly cool nights. Near the San Jose airport, mean maximum temperatures range from the high 70s to the low 80s in the summer, and from the high 50s to the low 60s during the winter. Mean minimum temperatures are in the low 40s during the winter and in the high 50s during the summer. Further inland areas to the south may have greater temperature extremes because the moderating effect of the Bay is not as strong. Santa Clara Valley has a high air pollution potential because of the valley’s large population; the transport of photochemical precursors from surrounding counties to the valley area; and the concentration of pollutants that occurs in the valley from the bordering mountains, winter inversions, and low-inversion summer days. (BAAQMD 2009b)

Air Quality Attainment Status

Air quality is a function of the climate, topography, and emissions in any area or upwind of that area. Table 3.2-2 presents the attainment status of the state and federal standards in the Bay Area. The San Francisco Bay Area Air Basin (SFBAAB), including Santa Clara County, is in attainment for carbon monoxide, nitrogen dioxide, sulfur dioxide, and lead pollutant standards. However, the SFBAAB is in non-attainment for the ozone and particulate matter national and state standards. In 2005, the BAAQMD completed an ozone strategy to implement all feasible measures to reduce ozone. This strategy was updated by the requirements of the 2010 Clean Air Plan to provide a control strategy to reduce particulate matter. (BAAQMD 2010)

Table 3.2-2. Bay Area Attainment Status of the State and Federal Ambient Air Quality Standards

Contaminant	Averaging Time	State Standards Attainment Status[1]	Federal Standards Attainment Status[2]
Ozone	1-hour	N	See note 4
	8-hour	N[7]	N[3]
Respirable Particulate Matter (PM_{10})	24-hour	N	U
	Annual arithmetic mean	N[6]	
Fine Particulate Matter ($PM_{2.5}$)	24-hour		N
	Annual arithmetic mean	N[6]	A
Carbon Monoxide	8-hour	A	A[5]
	1-hour	A	A
Nitrogen Dioxide	Annual arithmetic mean		A
	1-hour	A	U
Sulfur Dioxide	24-hour	A	A
	1-hour	A	
Lead	30-day average	A	
	Calendar quarter		A
Visibility Reducing Particles	8-hour	U	
Sulfates	24-hour	A	
Hydrogen Sulfide	1-hour	U	
Vinyl Chloride	24-hour	Not available	

A – attainment
N – non-attainment
U – unclassified
Notes:

1. California standards for ozone, carbon monoxide (except Lake Tahoe), sulfur dioxide (1-hour and 24-hour), nitrogen dioxide, suspended particulate matter—PM10, and visibility reducing particles are values that are not to be exceeded. The standards for sulfates, Lake Tahoe carbon monoxide, lead, hydrogen sulfide, and vinyl chloride are not to be equaled or exceeded. If the standard is for a 1-hour, 8-hour, or 24-hour average (i.e., all standards except for lead and the PM10 annual standard), then some measurements may be excluded. In particular, measurements are excluded that CARB determines would occur less than once per year on the average. The Lake Tahoe CO standard is 6.0 ppm, a level one-half the national standard and two-thirds the state standard.
2. National standards shown are the "primary standards" designed to protect public health. National standards other than for ozone, particulates and those based on annual averages are not to be exceeded more than once a year. The 1-hour ozone standard is attained if, during the most recent 3-year period, the average number of days per year with maximum hourly concentrations above the standard is equal to or less than one. The 8-hour ozone standard is attained when the 3-year average of the 4th highest daily concentrations is 0.075 ppm (75 ppb) or less. The 24-hour PM10 standard is attained when the 3-year average of the 99th percentile of monitored concentrations is less than 150 $\mu g/m^3$. The 24-hour $PM_{2.5}$ standard is attained when the 3-year average of 98th percentiles is less than 35 $\mu g/m^3$. Except for the national particulate standards, annual standards are met if the annual average falls below the standard at every site. The national annual particulate standard for PM_{10} is met if the 3-year average falls below the standard at every site. The annual $PM_{2.5}$ standard is met if the 3-year average of annual averages spatially-averaged across officially designed clusters of sites falls below the standard.
3. In June 2004, the Bay Area was designated as a marginal non-attainment area of the national 8-hour ozone standard. USEPA lowered the national 8-hour ozone standard from 0.80 to 0.75 PPM (i.e., 75 ppb) effective May 27, 2008. USEPA will issue final designations based upon the new 0.75 ppm ozone standard by July 31, 2011.
4. The national 1-hour ozone standard was revoked by USEPA on June 15, 2005.
5. In April 1998, the Bay Area was redesignated to attainment for the national 8-hour carbon monoxide standard.
6. In June 2002, CARB established new annual standards for $PM_{2.5}$ and PM_{10}.
7. The 8-hour California ozone standard was approved by CARB on April 28, 2005, and became effective May 17, 2006.

Source: BAAQMD 2009a

3.2.4 Impact Analysis

Methodology

Although existing SMP and proposed maintenance activities are and would be widespread, transitory, and short-term in nature, similar to construction activities, they serve and would continue to serve the purpose of maintaining existing features rather than constructing new features. Based on discussions with the BAAQMD, the BAAQMD's operational CEQA thresholds for projects are most appropriate for the Proposed Project (Michael, pers. comm., 2010).

Air emissions from proposed maintenance activities were estimated for three sources: off-road vehicles, on-road vehicles, and pesticide use. Off-road vehicle emissions were estimated using equipment data and CARB's OFFROAD 2007 model. On-road vehicle emissions were estimated using vehicle miles traveled (see Section 3.12, *Traffic and Transportation*) and CARB's Emissions Factors 2007 model. Pesticide use was based on a 4-year average (2007–2010) of SCVWD's pesticide use and the percentage of ROG in each pesticide, as identified in the California Department of Pesticide Regulation's Pesticide Volatile Organic Compound Emission Inventory. For a list of the type and quantity of pesticides used under the existing SMP, refer to Tables 3.6-1 and 3.6-2 in Section 3.6, *Hazards and Hazardous Materials*.

Criteria for Determining Significance

For the purposes of this analysis, the Proposed Project would result in a significant impact on air quality if it would:

A. conflict with or obstruct implementation of applicable air quality plans;

B. exceed any air quality standard by failing to adhere to assumptions used in the preparation of any Air Quality Plans;

C. result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors);

D. expose sensitive receptors to substantial pollutant concentrations; or

E. create objectionable odors affecting a substantial number of people.

Table 3.2-3 provides the BAAQMD's recommended significance criteria for analysis of air quality impacts. Based on discussions with the BAAQMD, the BAAQMD's operational CEQA thresholds for projects are most appropriate for the Proposed Project (Michael, pers. comm., 2010).

Emissions associated with the Proposed Project were estimated for the various SMP activities as a whole; for this reason, the impact discussion in this section relative to Significance Criteria A through D is not broken down by the individual categories of maintenance activities.

Table 3.2-3. BAAQMD CEQA Thresholds of Significance for Criteria Air Pollutants

Criteria Air Pollutants and Precursors (Regional)	Operational Thresholds	
	Average Daily Emissions (lb/day)	Maximum Annual Emissions (tpy)
Reactive Organic Gases (ROG)	54	10
Nitrogen oxides (NOx)	54	10
Particulate Matter (PM_{10})	82	15
Particulate Matter ($PM_{2.5}$)	54	10
$PM_{10}/PM_{2.5}$ (fugitive dust)	None	
Local Carbon Monoxide (CO)	9.0 ppm (8-hour average), 20.0 ppm (1-hour average)	
Risk and Hazards for new sources and receptors (Individual Project) Note: *Threshold for new receptors is effective May 1, 2011*.	Compliance with Qualified Community Risk Reduction Plan OR • Increased cancer risk of >10.0 in a million • Increased non-cancer risk of > 1.0 Hazard Index (Chronic or Acute) • Ambient $PM_{2.5}$ increase: > 0.3 µg/m^3 annual average Zone of Influence: 1,000-foot radius from property line of source or receptor	
Risk and Hazards for new sources and receptors (Cumulative Threshold). Note: *Threshold for new receptors is effective May 1, 2011.*	Compliance with Qualified Community Risk Reduction Plan OR • Cancer risk: >100 million (from all local sources) • Non-cancer risk: > 10.0 Hazard Index (from all local sources, Chronic) • Ambient $PM_{2.5}$: > 0.8 µg/m^3 annual average (from all local sources) Zone of Influence: 1,000-foot radius from property line of source or receptor	
Accidental Release of Acutely Hazardous Air Pollutants	Storage or use of acutely hazardous materials located near receptors or new receptors located near stored or used acutely hazardous materials considered significant	
Odors	Five confirmed complaints per year averaged over 3 years	

tpy – tons per year; lb/day – pounds per day; ppm – parts per million
Source: BAAQMD 2011

Environmental Impacts

Impact AIR-1: Temporary Increase in ROG, NOx, PM_{10}, and $PM_{2.5}$ Emissions during Maintenance Activities (Significance Criteria A, B, C, D; Less than Significant with Mitigation or Significant and Unavoidable)

Conducting the Proposed Project maintenance activities would generate emissions of criteria air pollutants. In particular, soil disturbance would cause temporary emissions of particulate matter. Fuel combustion involved with operating heavy equipment and on-road vehicles used to dispose debris also would release particulate matter and other contaminants associated with motor vehicle operation, including carbon monoxide and ozone precursors (ROG and NOx). Finally, use of pesticides would result in emissions of ROG.

This analysis considers emissions from both existing SMP activities (conducted pursuant to the 2002 SMP EIR) and additional emissions resulting from implementation of the Proposed Project (SMP update from 2012 to 2022). The existing SMP allows the majority of maintenance activities to be conducted between June 15 and October 15, although some activities occur year-round. The Proposed Project would extend the potential period when maintenance activities could be conducted (for those not occurring year-round), from October 15 to December 31. The overall work that would be conducted within the work window of the existing SMP is not anticipated to increase; rather, all additional work would occur during the extended work window.

Table 3.2-4 summarizes average daily operational emissions for 2012 and 2020 and Table 3.2-5 summarizes annual emissions estimates for 2012 and 2020. For additional information on how emissions were estimated refer to Appendix E. Although daily vehicle activity would not change substantially between 2012 and 2020, daily emissions are expected to decrease because turnover of fleet vehicles would replace higher-emitting vehicles with lower-emitting ones. Consequently, average daily vehicle emissions will be much lower in 2020 compared to 2012. Annual emissions from the Proposed Project compared to the existing SMP would increase corresponding to the increase in the number of work days per year, or twenty-five percent. This increase is offset by the decrease in emissions associated with fleet vehicle turnover.

Table 3.2-4. Estimated Proposed Project Average Daily Emissions of Criteria Air Pollutants, pounds per day

Emissions Source	ROG		NOx		PM_{10}		$PM_{2.5}$	
	2012	2020	2012	2020	2012	2020	2012	2020
Off-Road	44.2	25.7	388.3	138.1	16.3	5.4	16.3	5.4
On-Road	6.1	3.5	45.7	20.0	16.4	16.6	4.0	3.6
Pesticide Use	0.6	0.6	-	-	-		-	
Total	*50.9*	*29.7*	*434.0*	*158.1*	*32.8*	*22.0*	*20.4*	*9.0*
BAAQMD Threshold	54		54		82		54	

Note: Daily vehicle trips and vehicle miles traveled would remain the same in the SMP Update as in the existing SMP.
Source: Data compiled by Horizon Water and Environment in 2011

Table 3.2-5. Estimated Proposed Project Annual Emissions of Criteria Air Pollutants, tons per year

Emissions Source	ROG		NOx		PM_{10}		$PM_{2.5}$	
	2012	2020	2012	2020	2012	2020	2012	2020
Existing SMP								
Off-Road	1.9	1.1	16.5	5.9	0.7	0.2	0.7	0.2
On-Road	0.8	0.5	5.9	2.6	2.1	2.2	0.5	0.5
Pesticide Use	0.0	0.0	-	-	-		-	
Total	*2.7*	*1.6*	*22.4*	*8.5*	*2.8*	*2.4*	*1.2*	*0.7*
Additional Emissions under the SMP Update (2012-2022)								
Off-Road	0.5	0.3	4.1	1.5	0.2	0.1	0.2	0.1
On-Road	0.1	0.0	1.2	0.2	0.1	0.0	0.1	0.0
Pesticide Use	0.0	0.0	-	-	-		-	
Total	*0.6*	*0.3*	*5.4*	*1.7*	*0.3*	*0.1*	*0.2*	*0.1*
Total SMP								
Off-Road	2.3	1.4	20.6	7.3	0.9	0.3	0.9	0.3
On-Road	0.9	0.5	7.2	2.8	2.3	2.2	0.6	0.5
Pesticide Use	0.0	0.0	-	-	-		-	
Total	*3.3*	*1.9*	*27.8*	*10.2*	*3.1*	*2.5*	*1.4*	*0.8*
BAAQMD Threshold[1]	10		10		15		10	

Note:
1. See Table 3.2-3 for BAAQMD CEQA Thresholds of Significance for criteria air pollutants.
Source: Data compiled by Horizon Water and Environment in 2011

Table 3.2-4 shows that average daily emissions of criteria air pollutants from the SMP would be below BAAQMD construction significance thresholds, except for NOx. Table 3.2-5 shows that annual emissions of criteria air pollutants from the Proposed Project would be less than BAAQMD operational significance thresholds, except for NOx.

Applicable Best Management Practices

The following BMPs would be implemented as part of the SMP Update to control dust during maintenance activities. Descriptions of each BMP are provided in Chapter 2, *Project Description*.

BMP GEN-4: Minimize the Area of Disturbance
BMP GEN-29: Dust Management

Conclusion

Although emissions of criteria air pollutants other than NOx from the SMP would occur at levels below BAAQMD significance thresholds, implementation of BMPs would minimize PM_{10} and $PM_{2.5}$ emissions. Average daily and annual emissions of NOx from the SMP would be substantially greater than BAAQMD significance thresholds throughout the SMP. NOx emissions in exceedance of BAAQMD significance thresholds are considered a potentially significant impact.

The District would implement Mitigation Measure AIR-1A, reducing NOx emissions by 20 percent, which would lower NOx emissions below the significance threshold in 2020, but not in 2012. As a result, this impact would remain significant after this mitigation.

Therefore, the District would implement either Mitigation Measure AIR-1B or AIR-1C to offset remaining annual NOx emissions in exceedance of BAAQMD significance thresholds. Implementation of either Mitigation Measure AIR-1B or AIR-1C would reduce this impact to a less than significant level. However, it is possible that these mitigation measures may not be feasible because of the considerations discussed below. If the District found these mitigation measures to be infeasible, then this impact would be considered significant and unavoidable.

Mitigation Measure AIR-1A Reduction in Fleet Emissions

The District will develop a plan to demonstrate that the off-road equipment (more than 50 horsepower) to be used in the SMP Update (i.e., owned, leased, and subcontractor vehicles) would achieve a project–wide, fleet-average 20 percent NOx reduction compared to the most recent ARB fleet average. Acceptable options for reducing emissions include the use of late-model engines, low-emission diesel products, alternative fuels, engine retrofit technology, after-treatment products, add-on devices (such as particulate filters), and/or other options as they become available.

Mitigation Measure AIR-1B Off-site NOx Emissions Mitigation Program

SCVWD may establish a program to implement off-site NOx emissions reduction projects within the SFBAAB to reduce those NOx emissions from the SMP Update in exceedance of BAAQMD operational significance thresholds. The total reduction will be 9 tons (the average annual exceedance anticipated over the lifetime of the SMP Update, based on the average between estimated 2012 and 2020 emissions), as adjusted based on the emissions reductions to be achieved by Mitigation Measure AIR-1A. The NOx emission reductions projects will be from sources of emissions that are not required by any existing law to reduce their NOx emissions. Offsetting annual emissions inherently includes offsetting daily emissions. Therefore, no additional reductions will be required for daily NOx emissions. Documentation of off-site NOx reductions will be provided to the BAAQMD.

However, it is possible that this mitigation measure may not be feasible, based on costs, logistics, or other factors. In respect to logistics, whether the District could develop a new off-site mitigation program that effectively reduces emissions to less-than-significant levels in a timely manner is uncertain.

Mitigation Measure AIR-1C NOx Emissions Offsets

As an alternative to Mitigation Measure AIR-1B, SCVWD will purchase NOx emission reduction credits to reduce or offset those NOx emissions in exceedance of BAAQMD operational significance thresholds. The total reduction (or credits) will be 9 tons, as adjusted based on the emissions reductions achieved by Mitigation Measure AIR-1A.

Offsetting annual emissions inherently includes offsetting daily emissions. Therefore, no additional offsets will be required for daily NOx emissions.

SCVWD will engage a private broker to facilitate the purchase of credits through the BAAQMD emissions bank. Purchase of these credits from the BAAQMD emissions bank will ensure that NOx offsets occur in the SFBAAB. Once NOx emission reduction credits are purchased for a given quantity, that amount of NOx will be offset in perpetuity. Therefore, a one-time purchase of 9 tons of credits will mitigate for the duration of the SMP Update (2012-2022) as well as for future SMP-related emissions beyond 2022, assuming emissions will not have increased.

Documentation of purchased NOx offsets will be provided to the BAAQMD.

However, it is possible that this mitigation may not be feasible, based on costs or other factors.

Impact AIR-2: Diesel PM Health Risk during Maintenance Activities (Significance Criteria A, B, C, D; Less than Significant)

Exhaust emissions from on- and off-road vehicles and equipment used for maintenance under the Proposed Project would generate diesel PM, a toxic air contaminant. Individual maintenance activities would last from one day to several weeks. These maintenance activities would be countywide, transitory, and short term, and when they have ceased, so would associated diesel PM emissions.

Applicable Best Management Practices

The following BMP would be implemented as part of the SMP Update, and would help to minimize Diesel PM emissions. A description of the BMP is provided in Chapter 2, *Project Description*.

BMP GEN-35: Pump/Generator Operations and Maintenance

Conclusion

Health risk assessments for diesel PM are typically based on 9-, 40-, and 70-year exposure periods. Because of the short-term and highly variable nature of diesel PM emissions associated with the Proposed Project, exposure to diesel exhaust, including for sensitive receptors, would be well below the exposure period of concern. Therefore, exposure of persons to diesel PM generated by the Proposed Project would be less than significant and no mitigation would be required.

Mitigation Measures: No mitigation is required.

Impact AIR-3: Creation of Objectionable Odors (Significance Criterion E; Less than Significant)

Sediment removal is the only activity in the Proposed Project which has the potential to generate substantial objectionable odors.

Sediment Removal

Excavated sediment from stream channels may contain high levels of organic material. Natural decomposition of organic material depletes oxygen in the subsurface environment, leading to anaerobic conditions and the generation of hydrogen sulfide. Hydrogen sulfide gas then may be released when sediment is excavated. The potential concentrations of hydrogen sulfide gas released from sediment removal activities would not be substantial enough to adversely affect human health; however, they could cause annoyance by creating an objectionable odor in the vicinity of a specific maintenance/stockpile work site or reuse/disposal location. The intensity of odor from excavated sediment would depend on the amount and quality of sediment.

Conclusion

The BAAQMD indicates that odor impacts could result from siting a new odor source near existing sensitive receptors. However, SCVWD is not aware of instances under the existing SMP when excavated or stockpiled sediment has generated odors that have created an annoyance. Conditions are anticipated to be substantively similar under the SMP Update. Any odors, should they occur, would be localized, short-term, and would not be anticipated to affect a substantial number of people. Therefore, the impact from creation of objectionable odors would be less than significant and no mitigation would be required.

Mitigation Measures: No mitigation is required.

Chapter 3.3

BIOLOGICAL RESOURCES

3.3 Biological Resources

3.3.1 Introduction

This section presents the regulatory setting, environmental setting, and potential impacts of the Proposed Project related to biological resources. The section describes existing biological conditions in the Project Area and changes to the SMP and biological resources since 2002.

To identify biological resources, a number of documents were collected and reviewed including: the Final Environmental Impact Report for the Multi-Year Stream Maintenance Program (SCVWD 2002a), the 2002 Stream Maintenance Program (SCVWD 2002b), the 2012 Stream Maintenance Project Description (SCVWD 2010), SMP post-construction reports (SCVWD 2002d, 2003b, 2004b, 2005b, 2006b, 2007c, 2008b, and 2009b), and the 2002–2009 SMP fish relocation reports (SCVWD 2002c, 2003a, 2004a, 2005a, 2006a, 2007a, 2007b, 2008a, and 2009a). Data on special-status species occurrences compiled by SCVWD since 2001 were collected and reviewed: Rarefind data (CNDDB 2011); California wildlife habitat relationships information (CDFG 2008a); the Breeding Bird Atlas of Santa Clara County (Bousman 2007h); California Bird Species of Special Concern (Shuford and Gardali 2008); information available through the USFWS, including a list of special-status species potentially occurring in Santa Clara County; and other technical publications and previous reports.

All California Native Plant Society (CNPS) lists (CNPS 2011) and applicable records were reviewed to determine the potential for occurrence of special-status plant species in the Project Area. The Jepson Manual (Hickman 1993) supplied information regarding the distribution and habitats of vascular plants in Santa Clara County. In addition, the habitat-level ("land cover") and vegetation association descriptions in the working draft of the Santa Clara Valley Habitat Conservation Plan/Natural Communities Conservation Plan (Habitat Plan; ICF Jones & Stokes 2010) provided some indication of the potential locations of special-status plants.

SCVWD routinely conducts a variety of surveys and monitoring efforts that provide information on the presence and distribution of sensitive communities and plant and animal species, including special-status species and their habitats in SCVWD's service area. The following discussion summarizes information collected during the review, used to determine the environmental setting for the Proposed Project. A number of the studies used to compile the baseline biological conditions were performed prior to the publication of the Notice of Preparation (31 August 2010); such studies were used to inform the description of baseline conditions if they contributed relevant information regarding baseline biological conditions.

Vegetation Mapping

Aerial Information Systems, Inc. (AIS) conducted vegetation mapping of streams and canals in the Project Area in 2010. Vegetation units were mapped using aerial photo interpretation and interactive computer digitization methods. The vegetation classification system was based on *A Manual of California Vegetation* (Sawyer et al. 2009). Each vegetation unit was coded to the group level (alliance level where possible) and assigned a cover class density for the vegetation type mapped. This mapping involved a reconnaissance-level field visit to match preliminary aerial photo signatures with vegetation types on the ground before photo interpretation, as well as spot-checking of selected areas in the field after preliminary photo interpretation to verify the accuracy of mapping of certain vegetation types. In addition, in 2004 and 2008, SCVWD botanist J. Hillman surveyed SMP-maintained creeks and canals within serpentine communities and mapped high-quality examples of these communities.

Special-Status Plant Surveys

In 2004 and 2008 as part of the Biodiversity Monitoring Program, SCVWD conducted mapping of comprehensive botanical surveys for serpentine soils on all its creeks and canals, determined by overlaying U.S. Soil Conservation Service (USSCS, now the Natural Resources Conservation Service) and U.S. Geologic Survey (USGS) maps of serpentine soils on the Project Area map. That overlay indicated that 15.3 miles of canals were found to traverse serpentine soils and associated bedrock, as evidenced by associated plant species, vegetation types, and soil analysis (SCVWD unpublished data). During the 2004 and 2008 botanical surveys, 44 populations or partial populations of six special-status plant species were mapped by SCVWD botanist J. Hillman along the Almaden Calero Canal, Coyote Alamitos Canal, Coyote Canal, and Coyote Canal Extension. In contrast, no special-status plants were documented along any natural creeks in serpentine-dominated areas.

Fisheries Surveys

SCVWD has collected fish species distribution, occurrence, and abundance data for a variety of projects and conducted several types of fisheries surveys to meet specific information needs. Such surveys have included conducting habitat typing of fish assemblages at index reaches, and collecting data on species presence, disposition, and abundance at relocation sites. Fish relocations have been performed at various SMP work sites (see Table 3.3-1) throughout the past 9 years of the SMP (SCVWD 2002c, 2003, 2004, 2005, 2006, 2007a, 2007b, 2008, and 2009). Fish species, disposition, and abundance data were collected at each of these sites, and summaries of the fish captured and released (natives) or sacrificed (non-natives) were prepared for each year. Other general surveys related to habitat quality for salmonids have included the collection of hourly stream temperatures and bi-monthly reservoir profiles at certain locations, evaluating creeks to determine if they are ephemeral, and mapping passage impediments on some creeks. Examples of studies conducted by SCVWD that provide information on fish use of SMP creeks are listed in Table 3.3-2.

Table 3.3-1. Fish Relocation Creeks

Adobe Creek	Guadalupe River	Permanente Creek
Alamitos Creek	Hale Creek	Ross Creek
Berryessa Creek	Llagas Creek	San Tomas Aquino Creek
Calabazas Creek	Los Coches Creek	Saratoga Creek
Calero Creek	Lower Penitencia Creek	Stevens Creek
Coyote Creek	Lower Silver Creek	Sunnyvale East Channel
Greystone Creek	Matadero Creek	Upper Penitencia Creek
Guadalupe Creek	Mistletoe Creek	Wildcat Creek

Source: Compiled by Horizon Water and Environment in 2011

Table 3.3-2. Selected Recent SCVWD Fisheries Studies

Title	Year
Santa Clara Valley Water District Upmigrant and Outmigrant Trapping Operations for the Guadalupe River, Coyote Creek, and Stevens Creek	1998–2005
Santa Clara Valley Water District Guadalupe River Project Mitigation Monitoring Report	2000–2010
Fish Relocations for Stream Maintenance Program	2002–2009
Provenance Analysis of Chinook Salmon (*Oncorhynchus tshawytscha*) in the Santa Clara Valley Watershed	2002
Chinook Radio Tracking Report, Guadalupe River Watershed, 2003-2004	2004
Mid-Coyote Flood Protection Project Baseline Fisheries Monitoring Report Year 1 (2007)	2007
Population Genetics of *Oncorhynchus mykiss* in the Santa Clara Valley Region	2008
Mid-Coyote Creek Flood Protection Project Baseline Fisheries Monitoring Report Year 2 (2008)	2009
Lenihan Dam Outlet Modifications Project Fisheries Sampling Update, Project No. 91904005	2009

Source: Compiled by Horizon Water and Environment in 2011

California Red-legged Frog Surveys

Between 1996 and 2001, SCVWD surveyed portions of the Project Area for California red-legged frogs (*Rana draytonii*), following the 1997 USFWS protocol (USFWS 1997). Approximately 80 percent of the streams in the Project Area with suitable habitat and accessible to SCVWD were surveyed. Areas in the foothills and mountain ranges were less thoroughly surveyed because of difficulty accessing private land. SCVWD concluded that most of the County's ephemeral creeks do not support red-legged frog breeding habitat because of the absence of surface water during the tadpole-rearing season. Since 2001, SCVWD has conducted surveys for red-legged frogs in the context of pre-activity surveys for SMP activities. Furthermore, since 2004, annual surveys for the presence or absence of special-status amphibians have been conducted in numerous locations before the application of instream herbicides (see Table 3.3-3); no special-status amphibians were found at any of the locations listed in Table 3.3-3. These data sets were reviewed as part of the preparation of this document.

Table 3.3-3. Locations of Pre-Construction Presence/Absence Surveys for Special-Status Amphibians, 2004–2010

Creek Name	Creek Stationing		Creek Name	Creek Stationing	
	To	From		To	From
Adobe Creek	132+00	250+00	North Babb Creek	42+00	55+00
Alamitos Creek	21+55	232+00	Norwood Creek	0+00	32+00
Barron Creek	0+00	105+00	Penitencia East channel	0+00	36+00
Berryessa Creek	0+00	297+00	Permanente Creek	70+00	383+00
Calabazas Creek	20+00	447+30	Permanente diversion	0+00	71+00
Calera Creek	9+00	60+00	Piedmont Creek	0+00	26+00
Canoas Creek	0+00	390+00	Prospect Creek	0+00	20+00
Coyote Creek	480+00	776+00	Quimby Creek	0+00	38+00
Daves Creek	12+00	14+00	Randol Creek	0+00	89+00
Deer Creek	0+00	17+00	Regnart Creek	0+00	66+00
Deer Creek	74+00	91+00	Rodeo Creek	0+00	100+00
El Camino storm drain	0+00	20+00	Ross Creek	3+00	236+00
Flint Creek	0+00	20+00	Ruby Creek	0+00	20+00
Golf Creek	0+00	70+00	South Babb Creek	0+00	45+00
Greystone Creek	0+00	70+00	San Tomas Aquino Creek	26+00	224+00
Guadalupe Creek	1050+00	1130+00	San Tomas Aquino Creek	430+00	670+00
Guadalupe River	220+00	1044+00	Saratoga Creek	0+00	280+00
Hale Creek	0+00	60+00	Sierra Creek	0+00	63+00
Heney Creek	0+00	52+00	Smith Creek	0+00	92+00
Junipero Serra channel	0+00	132+00	Stevens Creek	88+00	410+00
Lone Hill Creek	0+00	20+00	Summerhill Creek	0+00	5+00
Los Coches Creek	0+00	62+00	Sunnyvale east channel	22+00	315+00
Los Gatos Creek	0+00	420+00	Sunnyvale west channel	44+00	140+00
Lower Silver Creek	0+00	318+00	Thompson Creek	0+00	65+00
Lower Silver Creek	370+00	380+68	Tularcitos Creek	1+00	36+00
Lower Penitencia Creek	0+00	216+00	Upper Penitencia Creek	35+00	65+00
Matadero Creek	95+00	200+00	Upper Penitencia Creek	72+00	115+00
Miguelita Creek	12+00	44+00	Upper Silver Creek	0+00	63+00
North Babb Creek	0+00	15+00			

Source: Compiled by Horizon Water and Environment in 2011

Bird Surveys

SCVWD has conducted surveys for the California clapper rail (*Rallus longirostris obsoletus*), least Bell's vireo (*Vireo bellii pusillus*), western snowy plover (*Charadrius alexandrinus nivosus*), and burrowing owl (*Athene cunicularia*) in various parts of the county since the mid-1990s. California clapper rail surveys have been conducted before maintenance activities in suitable habitat since 1996. Beginning in 1997, least Bell's vireo surveys were conducted annually (except in 2005, 2007, and 2008) during the breeding season along lower Llagas Creek, and occasionally along sections of Uvas Creek (Padley 2010, H. T. Harvey & Associates 2010b). Surveys for western snowy plovers have been conducted at potential work sites that contain suitable habitat, including ponds A4, A5, and A8 (Ryan 2000).

In 2007 and 2008, EDAW conducted a habitat assessment, burrow mapping study, and standardized protocol surveys for the burrowing owl along sections of multiple SCVWD-managed waterways in Palo Alto, Mountain View, Sunnyvale, Santa Clara, San Jose, Alviso, Milpitas, and Gilroy (EDAW 2008). In these areas, 236,214 linear feet of potential burrowing owl habitat along SCVWD waterways were assessed. The study was performed under SCVWD's Biodiversity Monitoring Program and was designed to monitor burrowing owl distribution, abundance, and trends in the Project Area.

Numerous surveys for nesting birds have been conducted for SCVWD compliance with the Migratory Bird Treaty Act. Surveys have occurred throughout Santa Clara County, but generally below the 1,000-foot elevation where SCVWD activities routinely occur. These surveys have investigated potential habitat for all special-status bird species.

3.3.2 Regulatory Setting

A number of federal, state, and local laws and ordinances regulate biological resources. Described next are the pertinent statutes and regulations.

Federal Plans, Policies, Regulations, and Laws

Clean Water Act

Areas meeting the regulatory definition of "waters of the U.S." (jurisdictional waters) are subject to the jurisdiction of the U.S. Army Corps of Engineers (USACE) under provisions of Section 404 of the 1972 Clean Water Act (federal Water Pollution Control Act) and/or Section 10 of the 1899 Rivers and Harbors Act (described below). These waters may include all waters used, or potentially used, for interstate commerce, including all waters subject to the ebb and flow of the tide, all interstate waters, all other waters (intrastate lakes, rivers, streams, mudflats, sandflats, playa lakes, natural ponds), all impoundments of waters otherwise defined as "waters of the U.S.," tributaries of waters otherwise defined as "waters of the U. S.," territorial seas, and wetlands (termed Special Aquatic Sites) adjacent to "waters of the U.S." (33 Code of Federal Regulations [CFR], Part 328, Section 328.3). Wetlands on non-agricultural lands are identified using the *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987).

Areas typically not considered jurisdictional waters include non-tidal drainage and irrigation ditches excavated on dry land, artificially irrigated areas, artificial lakes or ponds used for irrigation or stock watering, small artificial water bodies such as swimming pools, and water-filled depressions (33 CFR, Part 328). Canals subject to SMP activities are not expected to be jurisdictional because they were excavated in uplands and do not function as navigable waters or tributaries to navigable waters). Furthermore, the canals that are currently not in operation (Coyote, Coyote Extension, and Coyote Alamitos) do not carry water at all, other than runoff that is intercepted from upslope upland areas. However, whether or not the canals subject to SMP Update activities are jurisdictional waters of the U.S. is to be determined by the USACE.

Construction activities within jurisdictional waters are regulated by the USACE, and placement of fill into such waters must comply with USACE permit requirements. To comply with state and federal policy that no net loss of wetlands occurs, discharge into wetlands must be avoided and minimized to the extent practicable. For unavoidable impacts, compensatory mitigation is required to replace the loss of wetlands.

No USACE permit will be effective in the absence of state water quality certification, pursuant to Section 401 of the Clean Water Act. The State Water Resources Control Board (SWRCB) is the state agency (together with the Regional Water Quality Control Boards [RWQCBs]) charged with implementing water quality certification in California.

Project Applicability. SCVWD will apply for a Section 404 permit for the SMP Update. Any work within waters of the U.S. (i.e., wetlands and other waters), including relatively large waterways, small perennial and intermittent drainages, and wetlands maymay require a Section 404 fill discharge permit from the USACE and Section 401 Water Quality Certification from the RWQCB. Tidal salt marsh, tidal brackish marsh, most freshwater wetlands, and open water habitats (as described above) generally are considered waters of the U.S., subject to the jurisdiction of the USACE and RWQCB. As discussed above, the canals subject to SMP Update activities are not expected to be considered waters of the U.S.; however, this determination will be made by the USACE.

Rivers and Harbors Act

Section 10 of the Rivers and Harbors Act (1899) 33 U.S. Code (USC) 403 regulates the construction of structures, placement of fill, and introduction of other potential obstructions to navigation in navigable waters. Under Section 10 of the Act, the building of any wharfs, piers, jetties, and other structures is prohibited without congressional approval, and excavation or fill within navigable or tidal waters requires the approval of the chief of engineers.

The USACE has the authority to issue permits for the discharge of refuse into, or affecting, navigable waters under section 13 of the 1899 Act (33 USC 407; 30 Statute 1152). The Act was modified by Title IV of Public Law 92-500, October 18, 1972; the federal Water Pollution Control Act Amendments of 1972 (33 USC 1341–1345; 86 Statute 877), as amended, established the National Pollutant Discharge Elimination System (NPDES) permits.

Project Applicability. Any maintenance activities conducted within or over the tidally influenced portions of Guadalupe, Coyote, and Alviso sloughs and the lower reaches of Permanente, Stevens, San Tomas Aquino, Calabazas, San Francisquito, Coyote, and Lower Penitencia creeks, Sunnyvale East and West Channels, and Guadalupe River, potentially could require a Section 10 Letter of Permission.

Federal Endangered Species Act

The federal Endangered Species Act (FESA) identifies species at risk of extinction and protects them and their habitats from unauthorized take. Take is broadly defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to engage in any such conduct. Take also can include habitat modification or degradation that directly results in death or injury of a listed wildlife species. An activity can be defined as "take" even if it is unintentional or accidental. Listed plant species are legally protected from take under the FESA only if they occur on federal lands or if the project requires a federal action, such as a Clean Water Act Section 404 fill permit from the USACE.

The USFWS has jurisdiction over federally listed threatened and endangered plants, wildlife, and freshwater fish species under FESA, while the National Marine Fisheries Service (NMFS) has jurisdiction over federally listed, threatened, and endangered marine and anadromous fish. Authorized take can be obtained through Section 7 and/or Section 10 of the ESA. Federal agencies, such as the USACE, are required to consult with the USFWS or NMFS if their actions "may affect" a listed species. The USFWS and/or NMFS may issue an incidental take statement and Biological Opinion (BO) before the federal consulting agency issues a permit. The federal consulting agency then incorporates the incidental take statement and BO into any authorization or permits. Alternatively, in the absence of federal involvement, incidental take can be authorized through the development and implementation of a Habitat Conservation Plan.

Project Applicability. FESA compliance for the SMP Update will be achieved through Section 7 consultation implemented by the USACE, which will issue a Section 404 permit for the SMP Update (see above). Proposed Project maintenance activities maymay affect a number of federally listed species. Federally listed fish and wildlife species that occur, or could potentially occur, in the Project Area include the Bay checkerspot butterfly (*Euphydryas editha bayensis*), southern green sturgeon (*Acipenser medirostris*), Central California Coast steelhead (*Oncorhynchus mykiss*), South-Central California Coast steelhead, California tiger salamander (*Ambystoma californiense*), California red-legged frog, California condor (*Gymnogyps californianus*), California least tern (*Sterna antillarum browni*), least Bell's vireo, California clapper rail, western snowy plover, salt marsh harvest mouse (*Reithrodontomys raviventris*), and San Joaquin kit fox (*Vulpes macrotis mutica*). Federally listed plant species known to occur (or that have occurred historically) in the Project Area are the federally endangered Santa Clara Valley dudleya (*Dudleya setchellii*), Tiburon paintbrush (*Castilleja affinis* ssp. *neglecta*), Coyote ceanothus (*Ceanothus ferrisiae*), robust spineflower (*Chorizanthe robusta* var. *robusta*), Contra Costa goldfields (*Lasthenia conjugens*), and Metcalf Canyon jewel-flower (*Streptanthus albidus* ssp. *albidus*). Section 7 Consultation between the USACE, USFWS, and NMFS would be required to authorize incidental take of listed species.

Magnuson-Stevens Fishery Conservation and Management Act

The Magnuson-Stevens Fishery Conservation and Management Act governs all fishery management activities that occur in federal waters within the United States' 200-nautical-mile limit. The Act establishes eight Regional Fishery Management Councils responsible for the preparation of fishery management plans to achieve the optimum yield from U.S. fisheries in their regions. These councils, with assistance from the NMFS, establish essential fish habitat (EFH) in fishery management plans for all managed species. Federal agencies that fund, permit, or implement activities that may adversely affect EFH are required to consult with the NMFS regarding potential adverse effects of their actions on EFH, and respond in writing to recommendations by the NMFS.

Project Applicability. Proposed Project maintenance activities in tidal waters and in Coyote Creek maymay affect EFH. The only fish species subject to a fisheries management plan that occurs in the Project Area with any regularity is the Chinook salmon (*Oncorhynchus tshawytscha*), which is regulated by the Pacific Fishery Management Council's Salmon Fishery Management Plan. Both Coyote Creek and the San Francisco Bay are officially listed as EFH for this species (Pacific Fishery Management Council 1999), and Chinook salmon also occur in Los Gatos Creek and the Guadalupe River. Although the Chinook salmon in the Project Area have been recognized as strays from hatchery releases (NMFS 1999, Hedgecock 2002), NMFS still considers habitat used by Chinook salmon in the South Bay as EFH.

A number of fish species regulated by the Coastal Pelagics and Pacific Groundfish Fisheries Management Plans, such as the leopard shark (*Triakis semifasciata)*, English sole (*Parophrys vetulus)*, starry flounder (*Platichthys stellatus*), and big skate (*Raja binoculata*), occur in the tidal habitats of South San Francisco Bay and occasionally disperse upstream into the reaches of Alviso Slough, Coyote Slough, San Francisquito Creek, San Tomas Aquino Creek, and other tidal creeks in the Project Area. Species such as the northern anchovy (*Engraulis mordax*), Pacific sardine (*Sardinops sagax*), and jack mackerel (*Trachurus symmetricus*) also occur in the South Bay; these species are less likely to occur in the uppermost tidal reaches of sloughs where Proposed Project activities would occur, but small numbers could potentially occur there. Thus, the NMFS maymay consider these tidal waters to be EFH as well.

Federal Migratory Bird Treaty Act

The federal Migratory Bird Treaty Act (MBTA; 16 USC, Section 703, Supplement I, 1989) prohibits killing, possessing, or trading of migratory birds except in accordance with regulations prescribed by the Secretary of the Interior. The trustee agency that addresses issues related to the MBTA is the USFWS. Migratory birds protected under this law include most native birds (USFWS 2010a). This act encompasses whole birds, parts of birds, and bird nests and eggs. The MBTA protects active nests from destruction and nests, whether active or not, cannot be possessed. An active nest under the MBTA, as described by the Department of the Interior in its April 16, 2003 Migratory Bird Permit Memorandum, is one having eggs or young. Nest starts, before egg laying, are not protected from destruction.

Project Applicability. Almost all native bird species occurring in the Project Area would be protected by the MBTA.

State Plans, Policies, Regulations, and Laws

Section 401 Water Quality Certification

The RWQCB is responsible for protecting surface, ground, and coastal waters in its jurisdiction. It requires that a project proponent apply for and obtain a CWA Section 401 Water Quality Certification for any project that requires a CWA Section 404 permit from the USACE.

Project Applicability. As described under Clean Water Act above, any work within waters of the U.S. (i.e., wetlands and other waters), including relatively large waterways, small perennial and intermittent drainages, and wetlands, maymay require a Section 404 fill discharge permit from the USACE and Section 401 Water Quality Certification from the RWQCB. Tidal salt marsh, tidal brackish marsh, most freshwater wetlands, and open water habitats (as described above) generally are considered waters of the U.S., subject to the jurisdiction of the USACE and RWQCB.

Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act (Porter-Cologne Act) protects water quality and waters of the state of California. Activities that result in the discharge of fill material into "State Waters" that are not otherwise under the jurisdiction of the USACE (e.g., "isolated" wetlands without an interstate commerce connection or significant nexus to navigable waters of the U.S.) may require issuance of a Waste Discharge Requirements (WDRs) permit by the RWQCB pursuant to the Porter-Cologne Act and in compliance with the California Wetlands Conservation Policy.

The Porter-Cologne Act authorizes the RWQCB to issue permits to control pollution (i.e., WDRs and NPDES permits) in compliance with implementation of water quality standards as outlined in the region's Basin Plan and taking into consideration beneficial uses to be protected. These regulations limit impacts to aquatic and riparian habitats from a variety of water pollution sources.

Project Applicability. Any maintenance activities that would impact waters of the U.S. and/or State would require 401 certification and/or a WDR permit from the RWQCB.

McAteer-Petris Act

The McAteer-Petris Act was enacted in 1965 to promote responsible planning and regulation of San Francisco Bay. This law created the San Francisco Bay Conservation and Development Commission (BCDC), which is responsible for enforcing the McAteer-Petris Act, requiring that "maximum feasible public access, consistent with a project be included as part of each project to be approved by the BCDC." BCDC jurisdiction in the San Francisco Bay Area extends over the Bay, up to mean high tide and to 5 feet above mean sea level in marshes; and over a 100-foot shoreline band inland from the line of mean high tide or the line 5 feet above mean sea level adjacent to marshes. The Commission also has certain waterway jurisdiction in the vicinity of the Project area, along Coyote Creek and the Guadalupe River. The Commission does not have 100-foot shoreline band jurisdiction adjacent to its certain waterway jurisdiction. The Commission also has salt pond

jurisdiction consisting of all areas diked off from the bay and used between August 1966 and August 1969 for the solar evaporation of bay water in the course of salt production.

Project Applicability. Any maintenance activities that are conducted within tidal waters of the South San Francisco Bay or areas determined to be within the Shoreline Band may require a permit from the BCDC.

California Endangered Species Act

The California Endangered Species Act (CESA) (Fish and Game Code of California, Chapter 1.5, Sections 2050-2116) prohibits the take of any plant or animal listed or proposed for listing as rare (plants only), threatened, or endangered. In accordance with the CESA, the California Department of Fish and Game (CDFG) has jurisdiction over state-listed species. The CDFG regulates activities that may result in "take" of individuals listed under the Act (i.e., "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill"). Habitat degradation or modification is not expressly included in the definition of "take" under the Fish and Game Code. The CDFG, however, has interpreted "take" to include the "killing of a member of a species which is the proximate result of habitat modification."

Project Applicability. ~~Maintenance activities may result in the take of a number of state-listed species. A CESA take permit or other form of authorization may be required for State-listed wildlife species occurring (or potentially occurring) in the Project Area.~~ State-listed species potentially occurring in the Project Area include the longfin smelt (*Spirinchus thaleichthys*), California tiger salamander, bank swallow (*Riparia riparia*), California condor, bald eagle (*Haliaeetus leucocephalus*), Swainson's hawk (*Buteo swainsoni*), California clapper rail, California black rail (*Laterallus jamaicensis coturniculus*), California least tern, least Bell's vireo, salt marsh harvest mouse, and San Joaquin kit fox. ~~The only state-listed plant species known to occur in the Project Area is the state-threatened Tiburon paintbrush.~~ Of these, the California clapper rail, California black rail, California condor, bald eagle, and salt marsh harvest mouse are also listed as fully protected species; take of such species must be avoided. Maintenance activities may result in the take of other state-listed species, including the California tiger salamander and longfin smelt; a CESA Incidental Take Permit would be required for take of these species.

Native Plant Protection Act

The Native Plant Protection Act (California Fish and Game Code Sections 1900–1913) requires permits for collecting, transporting, or selling plant species designated rare, or endangered by the Fish and Game Commission.

Project Applicability. The CNPS has developed a set of lists of native plants in California according to rarity. Plants on List 1A, List 1B, and List 2 meet the definitions of Section 1901, Chapter 10 (Native Plant Protection Act) or Sections 2060 and 2067 (California Endangered Species Act) of the California Department of Fish and Game Code (Section 1900–1913) as rare or endangered species. These species were fully considered during CEQA review of the Proposed Project in the context of this document.

California Environmental Quality Act

The California Environmental Quality Act (CEQA) is a state law that requires state and local agencies, such as SCVWD, to document and consider the environmental implications of their actions and to refrain from approving projects with significant environmental effects if feasible alternatives or mitigation measures exist that can substantially lessen or avoid those effects. CEQA requires the full disclosure of the environmental effects of agency actions, such as approval of a general plan update or the projects covered by that plan, on resources such as air quality, water quality, cultural resources, and biological resources. The State Resources Agency-promulgated guidelines for implementing CEQA are known as the State CEQA Guidelines.

CEQA and the State CEQA Guidelines provide guidance in evaluating impacts of projects to biological resources and determining which impacts will be significant. CEQA defines "significant effect on the environment" as "a substantial adverse change in the physical conditions which exist in the area affected by the proposed project." Under State CEQA Guidelines Section 15065, a project's effects on biotic resources are deemed significant where the project would:

- substantially reduce the habitat of a fish or wildlife species;
- cause a fish or wildlife population to drop below self-sustaining levels;
- threaten to eliminate a plant or animal community; or
- "substantially reduce the number or restrict the range of an endangered, rare or threatened species"

In addition to the Section 15065 criteria that trigger mandatory findings of significance, Appendix G of the State CEQA Guidelines provides a checklist of other potential impacts to consider when analyzing the significance of project effects. For biological resources, these impacts include whether the project would:

- have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service;
- have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or U.S. Fish and Wildlife Service;
- have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act;
- interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native

resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites;

- conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance; or
- conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

Section 15380(b) of the State CEQA Guidelines provides that a species not listed as rare, threatened, or endangered under CESA or FESA (except insects that are considered pests) may be considered rare, threatened, or endangered if the species meet the stated definitions. This section deals with situations in which the USFWS or Fish and Game Commission have not acted to list a species as rare, threatened, or endangered but in which the species is locally or regionally rare.

The CDFG has produced three lists (amphibians and reptiles, birds, and mammals) of "species of special concern" that serve as "watch lists". Species on these lists are of limited distribution or the extent of their habitats has been reduced substantially, such that threat to their populations may be imminent. Thus, their populations should be monitored. They may receive special attention during environmental review as potential rare species but do not have specific statutory protection.

The CNPS, a non-governmental conservation organization, has developed lists of plant species of concern in California. Vascular plants included on these lists are defined as follows:

List 1A Plants considered extinct

List 1B Plants rare, threatened, or endangered in California and elsewhere

List 2 Plants rare, threatened, or endangered in California but more common elsewhere

List 3 Plants about which more information is needed—review list

List 4 Plants of limited distribution—watch list

These CNPS listings are further described by the following threat code extensions:

.1—seriously endangered in California

.2—fairly endangered in California

.3—not very endangered in California

Although the CNPS is not a regulatory agency and plants appearing on List 1B or List 2 are, in general, considered to meet CEQA's Section 15380 criteria, adverse effects to these

species may be considered significant. Impacts to plants that are listed by the CNPS on List 3 or 4 also are considered during CEQA review, although because these species are typically not as rare as those on List 1B or List 2, impacts to them are less frequently considered significant.

Project Applicability. All impacts to biological resources, including species not formally listed as rare, threatened, or endangered by the USFWS and CDFG, were considered during CEQA review of the Proposed Project. The significance guidance discussed above was considered in the determination of significance criteria for the evaluation of the Proposed Project.

California Fish and Game Code

The California Fish and Game Code Section 1601–1603 requires a Streambed Alteration Agreement for the fill or removal of material within the bed and banks of a watercourse or waterbody and for the removal of riparian vegetation.

Fish and Game Code Sections 3503, 3503.5, 3513, and 3800 (and other sections and subsections) protect native birds, including their nests and eggs, from all forms of take. Disturbance that causes nest abandonment and/or loss of reproductive effort is considered "take" by the CDFG. Non-game mammals are protected by Fish and Game Code Section 4150, and Fully Protected Species are protected by Sections 3505, 3511, 4700, 5050, and 5515.

The CDFG also maintains the California Natural Diversity Database (CNDDB) and the California Wildlife Habitat Relationships (CWHR) System. The CNDDB consists of historical observations of special-status plants, wildlife, and natural communities. Because the CNDDB is limited to reported sightings, it is not a comprehensive list of species that may occur in a particular area. However, it is useful in refining the list of special-status species that have the potential to occur on a particular site.

The CWHR is a comprehensive information system for terrestrial vertebrates and their habitats in California. It includes (1) a complete species list of California's terrestrial vertebrate species, (2) life history information and geographic range data on terrestrial species regularly occurring in California, (3) a standardized habitat classification scheme for California, and (4) a community-level matrix model associating the regularly occurring wildlife species with the standardized habitats. Under Section 1802 of the Fish and Game Code, the Department of Fish and Game is the trustee agency for fish and wildlife resources and shall review and comment on environmental documents.

Project Applicability. SCVWD will apply for a Section 1602 Streambed Alteration Agreement for the SMP Update. Maintenance activities would occur within the jurisdiction of the CDFG and would require a Streambed Alteration Agreement with CDFG. Maintenance activities may be required to take measures to avoid impacts to native mammals and nesting birds.

3.3.3 Environmental Setting

Climate and Soils

Santa Clara County has a Mediterranean climate characterized by mild, wet winters, and warm, dry summers. The county has unique natural biological communities, adapted to this precipitation regime. The unique natural communities and temperature regimes have resulted in endemic plant species that are adapted to long periods of drought and frequent fire events. Soil types ultimately play a large role in influencing distributions of habitats and wildlife. As detailed in Section 3.7, *Hydrology and Geomorphology*, soils vary considerably in the Project Area. Soils in and immediately surrounding San Francisco Bay tend to be fine-textured, clayey soils that were deposited by tidal events. Soils in the valley lowlands and farther inland are very deep, medium to fine-textured soils, ranging from poorly to excessively drained. Soils higher in the valley and in the foothills may be derived from sedimentary, basic igneous, or sometimes serpentine, rock with clayey, loamy textured soils (USSCS 1968).

Serpentine soils and bedrock support a unique assemblage of endemic plant and animal species in California. These soils form from weathered ultramafic rocks that provide relatively inhospitable conditions for plant growth, including: 1) a low calcium to magnesium ratio; 2) a lack of essential nutrients such as nitrogen, potassium, and phosphorus; and 3) high concentrations of heavy metals such as nickel and chromium that may be toxic to most plant species (Kruckeberg 1984). Plant species found on serpentine soils are adapted to or are able to tolerate these harsh soil conditions in areas where other plant species cannot grow as easily. Therefore, many special-status plants are endemics that are restricted to the range of serpentine soils. Serpentine in the Project Area is present as exposed bedrock outcrops, serpentine-derived soils, alluvially deposited serpentine soils at the edge of the valley floor and foothills, or a combination of these. The major concentrations of serpentine soils have been mapped for the county by the USSCS (1968). These include Coyote Ridge and other smaller serpentine outcrops on the east side of Coyote Valley south to the San Martin area; areas on the west side of Coyote Valley from the Santa Teresa Hills south to San Martin; small outcrops near Lexington, Calero and Coyote reservoirs; and inclusions within the valley, such as Communications Hill and Tulare Hill.

Existing Land Uses, Natural Communities, and Habitats

The Santa Clara Valley, which is dominated by agricultural and developed land uses, runs the length of the Project Area and is ringed by rolling hills. Plant communities in the Diablo Range to the east include grasslands, chaparral, and oak savannah (County of Santa Clara 2011b). Communities to the west in the Santa Cruz Mountains include rolling grasslands, oak woodlands, and mixed hardwood and evergreen forests (County of Santa Clara 2011b). The Baylands occupy the northern portion of the Project Area and consist mostly of former salt evaporation ponds and remnant marshes and wetlands. As the Project Area is so vast and contains some terrestrial communities and habitats that may not be subject to disturbance by the SMP Update, for purposes of this document, only the communities and habitat types that have the potential of being directly affected by the Proposed Project or occur adjacent to work areas are described. Based on dominant plant species in the Project Area as determined using the AIS vegetation mapping described previously, the Proposed

Project may affect the following natural communities/wildlife habitats: tidal salt marsh, tidal brackish marsh, freshwater wetlands (tidal and non-tidal), riparian forest and woodland, ruderal grasslands, serpentine grassland, serpentine seeps, serpentine rock outcrops, chaparral, oak woodland, and open water. The dominant and characteristic plant and animal species for each of these communities/habitats are described below, and a crosswalk between the vegetation units mapped by AIS and the natural communities/wildlife habitats described is provided in Table 3.3-4. Scientific names for plant species follow the nomenclature used in *The Jepson Manual Higher Plants of California* (Hickman 1993). An updated, second edition of *The Jepson Manual* is expected to be published in the later part of 2011. Appendix F provides a taxonomic crosswalk transcribing the species' scientific names from the 1993 edition of *The Jepson Manual* to the unpublished second edition that is provided on the Jepson Herbarium Web site (The Jepson Herbarium 2011, Baldwin et al. 2011). Figure 3.3-1 depicts an example of the vegetation mapping data prepared by AIS and used for the current analysis; inclusion of maps depicting vegetation-mapping units throughout the entire Project Area at a scale that allows interpretation in this document is infeasible because of the extent of the Project Area and the fine scale of the mapping units. In addition to the natural communities discussed below, the Proposed Project also may impact small areas of developed habitat (including roads) and non-native trees.

Table 3.3-4. Crosswalk between Natural Community/Wildlife Habitat Types and Vegetation Mapping Units

Natural Community/ Wildlife Habitat	Vegetation Mapping Units
Tidal Salt Marsh	Cordgrass *Salicornia* *Salicornia* – Salt Grass - *Jaumea*
Tidal Brackish Marsh	Bulrush – Cattail *Lepidium latifolium* Fresh or brackish bulrush spp.
Freshwater Wetlands	Arid freshwater emergent marsh group Bulrush-cattail *Typha* Western North American freshwater aquatic vegetation group *Eleocharis macrostachya*, *Downingia*, *Trifolium variegatum*, *Eryngium* Freshwater wet meadow
Riparian Forests and Woodlands	*Salix exigua* *Salix laevigata* *Toxicodendron diversilobum* *Sambucus nigra* *Rubus discolor* *Acer macrophyllum* *Acer negundo* Agriculture group *Aesculus californica* *Arundo donax* *Alnus rhombifolia* *Populus fremontii*
Riparian Forests and Woodlands cont.	*Quercus agrifolia* *Quercus lobata* *Juglans hindsii* *Umbellularia californica* Southwestern North American riparian evergreen and deciduous woodlands group *Baccharis salicifolia* Eucalyptus Southwestern North American riparian/wash scrub group *Platanus racemosa*
Ruderal/Non-native Grasslands	Mediterranean California naturalized annual and perennial grassland group *Baccharis pilularis* California perennial and annual grasslands group *Conium-Foeniculum* patches Cliffs and rock outcropping
Serpentine	Serpentine component mapping unit

Table 3.3-4. Crosswalk between Natural Community/Wildlife Habitat Types and Vegetation Mapping Units

Natural Community/ Wildlife Habitat	Vegetation Mapping Units
Chaparral and Coastal Scrub	*Adenostoma fasciculatum* *Arctostaphylos glauca* California xeric chaparral group
Oak Woodland	*Quercus agrifolia* *Quercus douglasii* *Quercus lobata*
Open Water	Reservoirs Water group Small earthen dam ponds and natural lakes River and lacustrine flats and streambeds Perennial Stream Channel Concrete Lined Channels Earth Lined Channels

Source: Mapped by AIS using units from Sawyer et al. 2009

Land Use

The northern half of Santa Clara County is extensively urbanized, by thirteen of the county's fifteen cities and 90 percent of its nearly 1.7 million residents (County of Santa Clara 2011a). It is a major employment center, providing more than 25 percent of all jobs in the Bay Area (County of Santa Clara 2011b). The southern half of the county is mostly rural, with the exception of Gilroy, Morgan Hill, San Martin, and scattered low-density residential developments. It contains most of the county's agricultural land. In addition to livestock and poultry, agricultural land uses include approximately 231,000 acres of field crops (e.g., alfalfa, grain, pasture), bushberries, strawberries, floral crops, forest products, fruits and nuts, vegetable crops, seed crops, and nursery crops (e.g., bedding plants, ornamental trees and shrubs, Christmas trees) (Santa Clara County Department of Agriculture 2009).

Tidal Salt Marsh

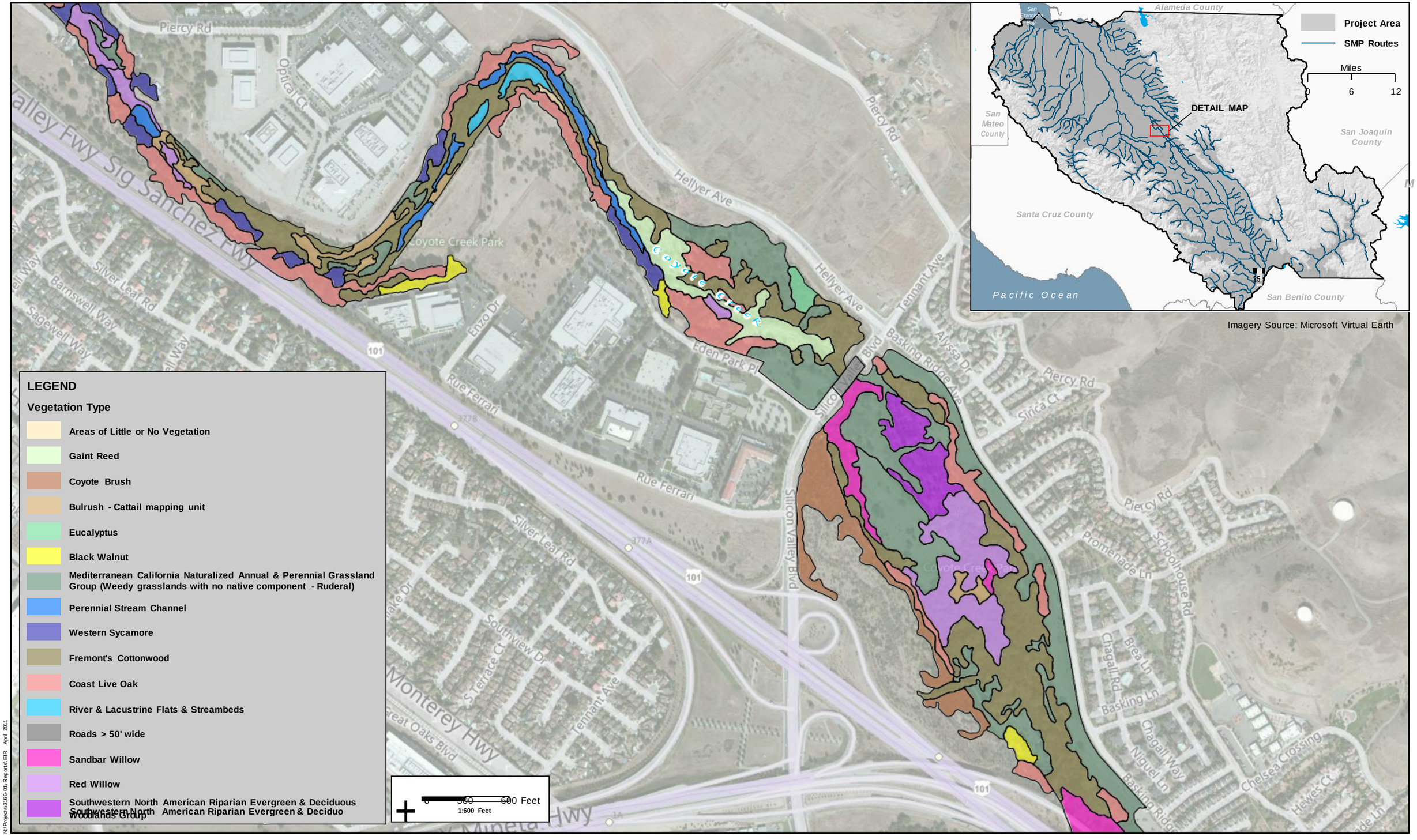
Tidal salt marsh is located in the lower reaches of creeks surrounding the San Francisco Bay and is influenced by fluctuations in the tide and salinity. Salt marshes in the Bay typically consist of three zones: low marsh dominated by cordgrass (*Spartina* spp.) occurring below the mean high water (MHW) mark; middle marsh dominated by pickleweed and occurring above MHW; and above this, a transitional high marsh zone with a mixture of pickleweed (*Salicornia* spp.) and other moderately halophytic species that can tolerate occasional high tides. Other halophytic plant species commonly found in salt marsh habitat located in the South Bay include alkali heath (*Frankenia salina*), saltgrass (*Distichlis spicata*), saltmarsh dodder (*Cuscuta salina*), spearscale (*Atriplex triangularis*), and marsh gumplant (*Grindelia stricta* var. *angustifolia*). These species typically occur above the MHW mark in the middle marsh and less disturbed areas of the high transitional marsh zone.

High marsh habitat often extends up levee banks in a disturbed ecotone that contains native marsh species as well as ruderal (disturbance-loving), non-native, salt-tolerant species such as iceplant (*Mesembryanthemum nodiflorum*), New Zealand spinach (*Tetragonia tetragonioides*), Russian thistle (*Salsola soda*), and Australian saltbush (*Atriplex semibaccata*), as well as perennial pepperweed (*Lepidium latifolium*). Differences in transitional, pickleweed, and cordgrass salt marsh habitat types affect wildlife use and sedimentation in the sloughs and channels draining into the Bay.

Two species of cordgrass are found in the South Bay, the native Pacific cordgrass (*Spartina foliosa*) and smooth cordgrass (*S. alterniflora*), which is native to the east coast of North America. Smooth cordgrass easily hybridizes with Pacific cordgrass, which can quickly lead to widespread distribution of the hybridized species. Smooth cordgrass (and its hybrids) and perennial pepperweed are the predominant invasive plant species found in the tidal salt marshes in the Project Area. Such invasions not only affect the food web, but also grow lower into channels than the native cordgrass. This can result in the loss of channels to vegetation encroachment and subsequent sedimentation (PWA and H.T. Harvey & Associates 2006), as well as loss of mudflats that are valuable to wildlife and native estuarine aquatic organisms. The Bay-wide Invasive Spartina Program (ISP; funded by the California Coastal Conservancy) along with the District's Spartina Control Program (part of the 2002–2012 SMP FEIR mitigation package) has been successful at minimizing the extent of hybrid *Spartina* in South Bay marshes. Small populations of hybrid *Spartina* still exist in the South Bay, however, the ISP is continuing to monitor and control this plant Bay-wide with the ultimate goal of eradication.

Tidal marshes in the Project Area are remnants of formerly much larger marshes. Tidal marshes support high densities of many wildlife species, including several species that are endemic to the San Francisco Bay. Based on trapping studies that have been conducted in a number of areas in the South Bay, the California vole (*Microtus californicus*) is often the most common small mammal species found in these tidal marshes, but the state and federally endangered salt marsh harvest mouse has been recorded in pickleweed-dominated marshes such as New Chicago, Nine-Par Marsh, and the Coyote Creek Salt Marsh Harvest Mouse Management Area. The salt marsh wandering shrew (*Sorex vagrans halicoetes*) has been recorded in New Chicago Marsh and other areas as well.

The state and federally endangered California clapper rail nests in cordgrass, dense stands of pickleweed, and marsh gumplant in tidal marsh habitats in the South Bay (e.g., Palo Alto Baylands, Alviso Slough, Guadalupe Slough, and Coyote Slough); this species is found in the lower marsh zone where numerous small tidal channels are present. Alameda song sparrows (*Melospiza melodia pusillula*) and Bryant's savannah sparrows (*Passerculus sandwichensis alaudinus*) also nest in tidal marshes. Alameda song sparrows prefer dense herbaceous vegetation wherever it occurs throughout the tidal marsh, while savannah sparrows nest in shorter vegetation such as pickleweed and high transitional marshes in upland ecotones. Other avian species that nest in tidal marshes in the South Bay include several species of ducks, herons, and egrets (Gill 1977). California black rails winter in small numbers in tidal marshes in the South Bay. Shorebirds, swallows, blackbirds, and other avian species roost and forage, often in large numbers, in tidal marsh habitats in the South Bay, but most do not breed in these areas.



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H. T. HARVEY & ASSOCIATES
ECOLOGICAL CONSULTANTS

Figure 3.3-1: Sample of Vegetation Mapping Performed for the SMP

Santa Clara Valley Water District Stream Maintenance Program EIR (3166-01)

July 2011

Tidal Brackish Marsh

Tidal brackish marsh habitat occurs in the upper intertidal reaches of sloughs and creeks draining into the Bay, where vegetation is subject to tidal inundation diluted by freshwater flows from upstream. This habitat type is dominated by emergent, vascular plant species adapted to intermediate (brackish) soil water salinities and consists of brackish marsh species including short bulrushes such as alkali bulrush (*Scirpus robustus*) and saltmarsh bulrush (*Scirpus maritimus*).

Wildlife communities are largely similar to those that occur in tidal salt marshes, with the potential for additional species to occur that prefer freshwater marshes. Marsh wrens (*Cistothorus palustris*), red-winged blackbirds (*Agelaius phoeniceus*), song sparrows (*Melospiza melodia*), and San Francisco common yellowthroats (*Geothlypis trichas sinuosa*) are common breeders in brackish marshes. Salt marsh species, such as the federally endangered salt marsh harvest mouse and California clapper rail, occur rarely in the brackish marsh habitat. Many additional tidal salt marsh and freshwater marsh species may forage in these areas, including ducks, herons, egrets, sparrows, larger shorebirds, and swallows.

Freshwater Wetlands

Freshwater wetlands in the Project Area can be divided into two distinct biotic sub-communities. These are freshwater marsh and seasonal wetlands. Water availability and microhabitat conditions, such as shading and soils, can determine the composition of wetland species. In the Project Area, freshwater marsh communities tend to occur in relatively long, linear patches, such as those along the lower freshwater reaches of streams that feed into the Bay (e.g., Saratoga Creek, Calabazas Creek, Permanente Creek, Guadalupe River); along Guadalupe Creek near the Los Capitancillos Percolation Ponds; and along Coyote Creek in the region of the Coyote Creek Park Chain. Seasonal wetlands in the Project Area typically occupy smaller, more discrete areas than freshwater marshes. They are found intermixed with freshwater marsh communities along Coyote Creek in the Coyote Creek Park Chain area and in the southern portion of the Project Area along Tar Creek, Tick Creek, and Uvas Creek.

In many parts of the Project Area, freshwater wetlands have been disturbed or lost because of urban development or agriculture. For example, Grossinger et al. (2007) estimated that the area of freshwater marsh on the valley floor portion of the Coyote Creek watershed has declined by 85-91 percent since the late 1700s.

Freshwater Marsh

Freshwater marshes are present primarily where perennial or near-perennial inundation by shallow, fresh water occurs in an open (i.e., not wooded) environment. These marshes typically are densely vegetated and dominated by bulrush (*Scirpus* spp.), rushes (*Juncus* spp.), sedges (*Cyperus* spp.), bur reed (*Sparganium* spp.) and cattails (*Typha* spp.). Other common freshwater marsh herbs in Santa Clara County are native and non-native smartweeds (*Polygonum* or *Persicaria* spp.) and primrose (*Ludwigia* spp.).

Freshwater marshes provide habitat for numerous bird species including ducks, gulls, terns, herons, egrets, and other waterbirds. The sora (*Porzana carolina*) and Virginia rail (*Rallus limicola*) forage in freshwater marshes in the Project Area during migration and in winter. American coots (*Fulica americana*), common moorhens (*Gallinula chloropus*), pied-billed grebes (*Podilymbus podiceps*), and several species of ducks breed in freshwater wetlands, channels, and ponds in and around emergent vegetation in the Project Area. Passerine species that breed in freshwater marshes include the marsh wren, song sparrow, common yellowthroat (*Geothlypis trichas*), and red-winged blackbird. Amphibians such as the native Pacific chorus frog (*Pseudacris regilla*) and western toad (*Anaxyrus boreas*), as well as the non-native American bullfrog (*Lithobates catesbeianus*), also are present in this habitat. However, special-status amphibians such as the California tiger salamander and California red-legged frog are not known to breed in the small patches that have been mapped as freshwater marsh habitat in the Project Area, although they have been observed in freshwater marshes in the surrounding mountains.

Seasonal Wetland

Seasonal wetlands form during the rainy season, typically in topographic low areas with underlying confining soil layers (generally clays and silts) that prevent water from percolating into the ground. Seasonal wetlands also may form on areas with seasonally high groundwater tables. Dominant plant species include those noted above for the freshwater marsh, including rushes and sedges such as tall umbrella sedge (*Cyperus eragrostis*), but they are more commonly dominated by non-native annual hydrophytic species such as rabbitsfoot grass (*Polypogon monspeliensis*), hyssop loosestrife (*Lythrum hyssopifolium*), white sweetclover (*Melilotus albus*), and bristly ox-tongue (*Picris echioides*).

Wildlife use of seasonal wetlands in the Project Area depends largely on the duration and depth of ponding, the extent of open water, and the structure and type of emergent vegetation. Most of the seasonal wetlands in the Project Area provide little open water, and they generally do not provide deep water. As a result, they are used primarily for winter and spring foraging by waterbirds, such as shorebirds, ducks, and geese. Song sparrows and red-winged blackbirds nest in vegetation in those seasonal wetlands that support taller, denser vegetation, and a variety of finches, sparrows, and other birds use this vegetation for cover and foraging habitat. Seasonal wetlands that provide standing water for at least several months support successful breeding by western toads and Pacific chorus frogs, while seasonal wetland swales that do not provide sufficient ponding provide only foraging habitat and moist refugia for these amphibians. In some areas, seasonal wetlands provide suitable breeding conditions for California tiger salamanders, if they hold water through May, and for California red-legged frogs, if they hold water into July. Common garter snakes (*Thamnophis sirtalis*) and western terrestrial garter snakes (*Thamnophis elegans*) forage in these wetlands for amphibian larvae.

Riparian Forests and Woodlands

As a result of the long history of human disturbance, isolation, and other urban-associated pressures that began in the late 1700s, many riparian habitats in the Project Area have undergone a shift in composition. For example, Grossinger et al. (2007) documented a substantial shift in land cover along much of Coyote Creek, from relatively open sycamore alluvial woodland, riparian scrub, and unvegetated gravel bars to more dense and

homogeneous riparian forest. In addition, riparian forests and woodlands in the Project Area are predominately restricted to narrow corridors along streams, and many reaches of streams support little or no woody vegetation. In some areas, channels are lined with concrete, riprap, or gabions (e.g., Guadalupe River near Hillsdale Avenue). Although native trees dominate most riparian woodlands and forests in the Project Area, non-natives abound as well, and exotic species, such as eucalyptus (*Eucalyptus* spp.), giant reed (*Arundo donax*), tree-of-heaven (*Ailanthus altissima*), elms (*Ulmus* spp.), and others occur frequently along these riparian systems.

In some areas, riparian forests and woodlands have been protected, and in some cases restored (particularly along the larger streams such as Coyote Creek and the Guadalupe River), by SCVWD and others. Even though riparian land cover is limited, these habitats contribute a disproportionately high amount to landscape-level wildlife species diversity. The presence of water and abundant invertebrate fauna provide foraging opportunities for many species. The diverse habitat structure provides cover, nesting opportunities, and migratory corridors for many wildlife species in the region, supporting the most diverse bird communities in the Project Area (Rottenborn 1997).

Three major types of riparian forest and scrub communities occur in the Project Area: willow riparian forests, woodlands, and scrub; mixed riparian forest and woodland; and central California sycamore alluvial woodland (ICF Jones & Stokes 2010). Central California sycamore alluvial woodland is considered a sensitive natural vegetation community by the CDFG (2007).

Willow Riparian Forests, Woodlands, and Scrub

Willow riparian forests, woodlands, and scrub comprise the most common riparian habitat type in the Project Area. These woodlands occur in the majority of drainages in the Santa Clara Valley.

Willow species, such as the yellow willow (*Salix lucida ssp. lasiandra*), red willow (*Salix laevigata*), arroyo willow (*Salix lasiolepis*), sandbar willow (*Salix exigua*), and mulefat (*Baccharis salicifolia*) dominate willow riparian forests, woodlands, and scrub habitat in the Project Area. Most willow riparian habitat in the Project Area supports invasive trees such as black locust (*Robinia pseudoacacia*), holly oak (*Quercus ilex*), eucalyptus, tree-of-heaven, and elms, as well as invasive herbaceous plants such as periwinkle (*Vinca major*) and English ivy (*Hedera helix*) that dominate the understory. Other areas contain native understory species, such as California blackberry, poison oak (*Toxicodendron diversilobum*), toyon (*Heteromeles arbutifolia*), and Mexican elderberry (*Sambucus mexicana*).

Willow riparian habitats that include large, mature riparian trees occur along select portions of Coyote Creek and the Guadalupe River, with smaller areas dominated by mature trees present along other SMP-maintained streams as well. Dominant native canopy species in these areas include willows and Fremont cottonwood (*Populus fremontii* spp. *fremontii*), along with native understory species such as elderberry and wild rose (*Rosa californica*).

Dense, native willow riparian forests provide habitat for relatively high densities of native nesting songbirds, such as song sparrows, black-headed grosbeaks, and warbling vireos.

This habitat also is more likely to support native bird and mammal species, such as Swainson's thrushes (*Catharus ustulatus*), yellow warblers, yellow-breasted chats (*Icteria virens*), and San Francisco dusky-footed woodrats.

The wider, more mature willow riparian corridors contain suitable foraging and breeding habitat for several functional groups of birds including insectivores (e.g., warblers, flycatchers), seed-eaters (e.g., finches), raptors, and cavity-nesters (e.g., swallows and woodpeckers). Among the numerous species of birds that use the riparian habitats in the Project Area for breeding are the Pacific-slope flycatcher (*Empidonax difficilis*), black-headed grosbeak (*Pheucticus melanocephalus*), warbling vireo (*Vireo gilvus*), yellow warbler (*Dendroica petechia*), belted kingfisher (*Ceryle alcyon*), and black-chinned hummingbird (*Archilochus alexandri*).

Several species of reptiles and amphibians occur in these riparian corridors in the Project Area. Leaf litter, downed tree branches, and fallen logs provide cover for the arboreal salamander (*Aneides lugubris*), western toad, and Pacific chorus frog. Several lizards may also occur here, including the western fence lizard (*Sceloporus occidentalis*), western skink (*Eumeces skiltonianus*), and southern alligator lizard (*Elgaria multicarinata*). Western pond turtles (*Actinemys marmorata*) and the non-native red-eared sliders (*Trachemys scripta*) use riparian habitat, particularly for breeding and winter aestivation. Bats and small mammals, such as the ornate shrew (*Sorex ornatus*), California vole, and Audubon's cottontail (*Sylvilagus audubonii*) use these riparian habitats as well. San Francisco dusky-footed woodrats (*Neotoma fuscipes annectens*) occur, often at high densities, in riparian habitats in less developed areas, such as in Coyote Valley, but they are often absent from heavily urbanized streams. Medium-sized mammals, such as the raccoon (*Procyon lotor*) and striped skunk (*Mephitis mephitis*), also are common in this habitat. Non-natives such as the opossum (*Didelphis virginiana*), eastern fox squirrel (*Sciurus niger*), Norway rat (*Rattus norvegicus*), red fox (*Vulpes vulpes*), and feral cat (*Felis catus*) may harass, compete with, or depredate eggs and young of native birds and small mammals, reducing the quality of this habitat for native riparian wildlife species.

Mixed Riparian Forest and Woodland

Mixed riparian forest and woodland habitat occurs in several drainages and persists in the foothills of the Project Area, along Thompson Creek, Uvas Creek, upstream reaches of Coyote Creek, Llagas Creek (above Chesbro Reservoir), Alamitos Creek, Calero Creek, and drainages east of Anderson Reservoir. White alder, big leaf maple, and western creek dogwood occur in lower densities in the Project Area.

Mixed riparian forest and woodland habitat is composed of white alder (*Alnus rhombifolia*), Fremont cottonwood, California sycamore (*Platanus racemosa*), coast live oak (*Quercus agrifolia*), valley oak (*Quercus lobata*), California bay (*Umbellularia californica*), and box elder (*Acer negundo*). Understory trees and shrubs include willows (*Salix* spp.), California buckeye (*Aesculus californica*), native and introduced blackberry (*Rubus* spp.), and poison oak.

The structural diversity of mixed riparian forests in the Project Area supports high diversities of riparian-breeding species, and many of the same species found in willow

riparian forests also are present in mixed riparian habitats, but the lower vegetation volume of mixed riparian forests results in lower bird densities. Additional species that prefer low-density riparian habitats and higher structural diversity are likely to be present throughout this habitat type, including chestnut-backed chickadees (*Poecile rufescens*), oak titmice (*Baeolophus inornatus*), bushtits (*Psaltriparus minimus*), finches, black phoebes (*Sayornis nigricans*), western scrub-jays (*Aphelocoma californica*), house wrens (*Troglodytes aedon*), American robins (*Turdus migratorius*), and dark-eyed juncos (*Junco hyemalis*). Raptors, such as red-shouldered hawks (*Buteo lineatus*) and Cooper's hawks (*Accipiter cooperii*), nest within these riparian corridors and forage in adjacent habitats. Oak, cottonwood, and sycamore trees also support cavity-nesting bird species such as woodpeckers, American kestrels (*Falco sparverius*), barn owls (*Tyto alba*), and bat colonies.

Central California Sycamore Alluvial Woodland

Central California sycamore alluvial woodland, a CDFG sensitive natural vegetation community (CDFG 2007), occurs primarily in the upper watersheds above the Project Area, such as along Llagas, Uvas, Alamitos, Guadalupe and Stevens creeks, and the upstream reaches of Coyote and Upper Penitencia creeks. It occurs on broad valley floors along low, braided riparian channels. This land cover type usually forms only where floodplains are broad, along low gradient streams flowing over deep alluvial deposits. Sycamore alluvial woodland stands have an open canopy dominated by California sycamore, often interspersed with white alder and willows. Other associated species may include valley oak, coast live oak, and California bay. Winter flows typically scour the understory vegetation each season, and as such, herbaceous vegetation is spare and patchy. Riparian species such as willows, coyote brush (*Baccharis pilularis*), mulefat, California buckeye, blackberry, Italian thistle (*Carduus pycnocephalus*), poison oak, common chickweed (*Stellaria media*), and bedstraw (*Galium aparine*) may occur along the outer stream banks.

Sycamore woodlands provide habitat for many species of bats, including the pallid bat (*Antrozous pallidus*), Brazilian free-tailed bat (*Tadarida brasiliensis*), Yuma myotis, California myotis (*Myotis californicus*), and big brown bat (*Eptesicus fuscus*). Cavity-nesting bird species, such as woodpeckers and American kestrels, are also likely to be found breeding in this habitat. Red-tailed hawks (*Buteo jamaicensis*), red-shouldered hawks, great-horned owls (*Bubo virginianus*), and other raptors nest in the larger trees in this habitat and forage in adjacent habitats. Species that prefer thick understory cover, such as towhees and sparrows, are less abundant in sycamore woodlands compared with other riparian habitats.

Ruderal/Non-Native Grasslands

California annual grassland habitat occurs commonly on undeveloped parcels and constructed levees throughout the Project Area. The largest expanses of this habitat are present on hills surrounding Coyote Valley, in the northern portion of the Santa Teresa Hills, to the east of Anderson Reservoir, and elsewhere along the hilly eastern margin of the Project Area. This habitat type also extends into Alviso, and along the valley floor on both sides of upper Coyote Creek north of the Morgan Hill city limits.

Grassland communities are characterized by a dominance of grass and herb species, with less than 10 percent cover by trees and shrubs. Dominant plant species are non-native

annual grasses, such as ripgut brome (*Bromus diandrus*), Italian ryegrass (*Lolium multiflorum*), and wild oats (*Avena* sp.). Associated species include many native and non-native forbs, such as California poppy (*Eschscholzia californica*), lupine (*Lupinus* spp.), and filaree (*Erodium* spp.).

Native grassland habitat (non-serpentine) is distributed in small patches throughout portions of the California annual grassland habitat and typically includes a component of native purple needlegrass (*Nassella pulchra*) growing in association with wild oats and ripgut brome. It is relatively rare to find native grasslands dominated (i.e., greater than 50 percent by relative percent cover) by purple needlegrass in the Santa Clara Valley.

A small area of rock outcrops consisting of exposed non-serpentine bedrock occurs in the Project Area within California annual grassland habitat north of Alamitos Creek in the Santa Teresa Hills. These rock outcrops are devoid of soil and typically do not support vascular plants except within crevices that have accumulated soil. One exception is that several species of non-special-status dudleya (*Dudleya* spp.) are able to grow in cracks and fractures of the outcrops. In addition, mosses and other epiphytes may grow in some crevices that can retain water for a short duration.

Wildlife use of grasslands in much of the Project Area is limited by human disturbance, extent of the habitat in a specific area, abundance of non-native and invasive species, and isolation of grassland habitat remnants from more extensive grasslands. As a result, some of the wildlife species associated with extensive grasslands, such as grasshopper sparrows (*Ammodramus savannarum*), breeding Bryant's savannah sparrows, and western meadowlarks (*Sturnella neglecta*) are absent from small patches of grassland within the urban matrix that occupies most of the Project Area. However, much of the grassland around the periphery of the Project Area is contiguous with larger expanses of grassy open space, and thus provides higher-quality habitat for grassland-associated wildlife species.

California ground squirrels (*Spermophilus beecheyi*), where they are present, are an important component of these grassland communities, providing a prey base for diurnal raptors and terrestrial predators. The burrows of California ground squirrels also provide refugia for several special-status wildlife species, such as the burrowing owl and the California tiger salamander. Other rodent species that are likely present in grassland habitats include the California vole, valley pocket gopher (*Thomomys bottae*), and deer mouse (*Peromyscus maniculatus*). Diurnal raptors such as red-tailed hawks, northern harriers (*Circus cyaneus*), white-tailed kites (*Elanus leucurus*), and American kestrels forage for these small mammals over grasslands during the day, and at night nocturnal raptors, such as barn owls, forage for nocturnal rodents, such as deer mice. Loggerhead shrikes (*Lanius ludovicianus*) forage in grassland habitats for insects and other prey.

Open grassland habitat with bare ground is important foraging habitat for the pallid bat and Brazilian free-tailed bat. Mammals such as the coyote (*Canis latrans*), American badger (*Taxidea taxus*), black-tailed jackrabbit (*Lepus californicus*), and striped skunk utilize grassland habitats in the Project Area for foraging. Reptiles such as western fence lizards, southern alligator lizards, western skinks, western terrestrial garter snakes, gopher snakes (*Pituophis catenifer*), racers (*Coluber constrictor*), western rattlesnakes (*Crotalus viridis*), and common kingsnakes (*Lampropeltis getula*) also frequent these habitats.

Serpentine

Serpentine bunchgrass grasslands, rock outcrops/barrens, seeps, and chaparral are considered sensitive communities by virtue of their importance to special-status plants and animals and their relatively limited extent (CDFG 2007, ICF Jones & Stokes 2010).

Serpentine Bunchgrass Grassland

Serpentine bunchgrass communities have been documented in the Project Area primarily on either side of the Santa Clara Valley, from Coyote Ridge on the east and the Santa Teresa Hills on the west, south to the San Martin area. Smaller patches of serpentine grassland occur elsewhere, such as on Communications Hill, Tulare Hill, and north of Alum Rock in San Jose.

Serpentine bunchgrass grasslands occur on soils derived from serpentine rock substrates. Most serpentine soils support a diverse grassland assemblage dominated by California dwarf plantain (*Plantago erecta*), Italian ryegrass, and spring and summer wildflowers, including goldfields (*Lasthenia* spp.), buttercup (*Ranunculus californicus*), purple owl's clover (*Castilleja exserta*), and tidy-tips (*Layia platyglossa*, *L. chrysanthemoides*), among many others. Native grasses, such as purple needlegrass, junegrass (*Koeleria macrantha*), big squirreltail (*Elymus multisetus*), creeping wildrye (*Leymus triticoides*), and other perennial bunchgrasses are common throughout this community.

Serpentine grasslands are highly infertile because of their extremely high levels of magnesium, chromium, and nickel; low concentrations of nutrients such as calcium and nitrogen; and low water-holding capacity. A unique group of vascular plant species, which can tolerate the relatively high magnesium to calcium ratio, has evolved in response to these conditions. As a result, serpentine grasslands generally support native plant communities, including rare plants, such as the federally listed Santa Clara Valley dudleya and Metcalf Canyon jewel-flower, as well as most beautiful jewel-flower and smooth lessingia (see also Special-Status Plant Species below). In turn, several invertebrate species, including the federally threatened Bay checkerspot butterfly, depend on serpentine grasslands because their host food plants are found primarily in these habitats.

The Bay checkerspot butterfly occurs in native serpentine grassland communities that support dense stands of its primary larval food plant, dwarf plantain. Larvae also utilize secondary larval food plants such as owl's clover (*Orthocarpus* spp.), and adult butterflies use nectar from plants such as goldfields, onion (*Allium* spp.), tidy-tips, cream cups (*Platystemon californicus*), and lomatium (*Lomatium* spp.). This species is associated primarily with large expanses of serpentine grassland, characterized by a diversity of slope exposures and moderate-to-high grazing intensity.

Bird species that occur most abundantly in serpentine grassland habitats in the Project Area include the grasshopper sparrow, horned lark (*Eremophila alpestris*), rufous-crowned sparrow (*Aimophila ruficeps*), and rock wren (*Salpinctes obsoletus*). These species are well adapted to the patchy distribution of bunchgrass vegetation in serpentine habitats.

Serpentine Rock Outcrops/Barrens

Serpentine rock outcrops/barrens lack soil entirely and are typically devoid of vegetation, with visible rock outcrops usually covered in crustose (forming a crusty, fixed mass that covers the surface on which it grows) lichen species. Serpentine rock outcrops/barrens are found in a patchwork of low-growing serpentine plant communities in the grasslands on either side of Coyote Valley (including extensive areas on Coyote Ridge), Communications Hill, Tulare Hill, the Santa Teresa Hills, and in the San Vicente area west of Calero Reservoir and in the field south of Suncrest Avenue in the Alum Rock area, interspersed with intact, undisturbed patches of sagebrush chaparral communities. This habitat tends to exclude most special-status plant species as no soil accumulation exists in these areas; however, the federally endangered Santa Clara Valley dudleya occurs primarily in this habitat type. Crevices in these outcrops provide refugia for western fence lizards, common kingsnakes, and western rattlesnakes. Rock wrens hide their nests in these outcrops.

Serpentine Seep

Several serpentine seeps, small wetlands that typically lack woody vegetation and are fed by small springs or creeks supported by groundwater, occur in the Santa Teresa Hills and all along Coyote Ridge. These seeps are distinguished from other wetlands because they occur on serpentine soils within serpentine grassland habitat. Many of the serpentine seeps in the Project Area support the special-status Mt. Hamilton thistle (*Cirsium fontinale var. campylon*); this is the only habitat type in which this species occurs. Serpentine seeps are wetland habitats that provide moist refugia for Pacific chorus frogs, western toads, and other amphibians, but typically do not pond water deep enough to provide suitable breeding habitat for these species. They also are so limited in extent that they are infrequently used by other aquatic/wetland-associated wildlife species, such as shorebirds or waterfowl.

Mixed Serpentine Chaparral

Mixed serpentine chaparral is an uncommon chaparral-type that is generally composed of chaparral species tolerant of a broad range of soil conditions such as those listed above, as well as species that are limited to serpentine soils such as leather oak (*Quercus durata*), Coyote ceanothus, and chaparral silktassel (*Garrya congdonii*). The dominant shrubs in mixed serpentine chaparral are often dwarfed and spaced more widely than is typically seen in non-serpentine stands (Holland and Keil 1995). Grass and herbaceous vegetation may or may not be present in the spaces between the shrubs. This unique community supports many special-status plants such as Coyote ceanothus, Santa Clara thornmint (*Acanthomintha lanceolata*) and Sharsmith's harebell (*Campanula sharsmithiae*). Wildlife species typical of this community are similar to those described for chaparral and coastal scrub below.

Chaparral and Coastal Scrub

In the Project Area, chaparral and coastal scrub communities were mapped primarily in the area between Calero Reservoir and Almaden Quicksilver Park and along the Coyote Creek Park Chain. These are characterized by drought-tolerant, shrub-dominated landscapes that are exposed to intense sunlight. These habitat types form dense stands of shrubs with little understory and are prone to intense and regular fire cycles in natural settings. After a fire event, these habitat types recover quickly and support extraordinary blooms of annual

forbs adapted to fire during the first few years as the shrub canopy develops. Typical dominant species found in chaparral communities are chamise (*Adenostoma fasciculatum*), bigberry manzanita (*Arctostaphylos glauca*), ceanothus (*Ceanothus* spp.), and scrub oak (*Quercus* spp.). Typical dominant species found in coastal scrub communities are black sage (*Salvia mellifera*), coyote brush, and California sagebrush (*Artemisia californica*). Coastal scrub communities generally occur on exposed sites with shallow, rocky soils. Overall, the shrub species comprising coastal scrub communities are lower in stature than chaparral and appear more open. In contrast, once the manzanita and ceanothus shrubs that dominate chaparral reach maturity these plants form a dense, impenetrable thicket of broad-leaved sclerophylous shrubs.

Chaparral and coastal scrub habitats typically are dry and provide relatively low and homogeneous structure. In addition, the areas where these habitats occur in the Project Area are small and often surrounded by other habitat types, such as annual grassland and oak woodland. Therefore, wildlife utilization of these areas is largely determined by adjacent habitats. Nevertheless, a number of animal species occur in these habitats.

Amphibians are usually absent or scarce in chaparral habitats because of their very dry conditions, and many other wildlife species occurring here either derive moisture directly from food or synthesize their water metabolically from seeds (e.g., the California pocket mouse [*Chaetodipus californicus*]). Mammals that use chaparral and coastal scrub habitats for cover include the coyote, bobcat (*Lynx rufus*), and brush rabbit (*Sylvilagus bachmani*), among others. Nests of San Francisco dusky-footed woodrats often are present where oaks and/or poison oak are mixed with coyote brush scrub. California mice (*Peromyscus californicus*), which occupy woodrat nests, also are present. Bird species that nest in chaparral habitats include the California thrasher (*Toxostoma redivivum*), California towhee (*Pipilo crissalis*), spotted towhee (*Pipilo maculatus*), California quail (*Callipepla californica*), wrentit (*Chamaea fasciata*), loggerhead shrike, lesser goldfinch (*Carduelis psaltria*), and Anna's hummingbird (*Calypte anna*). Rufous-crowned sparrows often nest where these habitats are dominated by California sagebrush. Reptiles that occur in these habitats include the gopher snake, western rattlesnake, southern alligator lizard, striped racer (*Masticophis lateralis*), California horned lizard (*Phrynosoma coronatum frontale*), and western fence lizard.

Oak Woodland

Oak woodland communities in the Project Area typically occur at elevations above 300 feet and are characterized by native California oaks (e.g., coast live oak, valley oak, and blue oak [*Quercus douglasii*]). Representative understory plants are weedy annual grasses, some native and introduced forbs, and occasional shrubs, such as toyon, poison oak, California coffeeberry (*Rhamnus californica*), and common snowberry (*Symphoricarpos albus var. laevigatus*). The special-status species big-scale balsamroot (*Balsamorhiza macrolepis var. macrolepis*) and robust monardella (*Monardella villosa ssp. globosa*) occur in oak woodland habitats.

Many of the oak woodland habitats in the Project Area have been fragmented by urban and suburban land uses. Nevertheless, they still support a number of the common oak-associated wildlife species in the region. The western scrub-jay, acorn woodpecker

(*Melanerpes formicivorus*), oak titmouse, Nuttall's woodpecker (*Picoides nuttallii*), chestnut-backed chickadee, spotted towhee, and white-breasted nuthatch (*Sitta carolinensis*) are year-round residents. Dusky-footed woodrats also are frequently found in oak woodlands. The deer mouse, California mouse, and the introduced eastern gray squirrel (*Sciurus carolinensis*) nest and forage in this habitat as well. Reptiles found in adjacent grassland and scrub habitats also occur regularly in oak woodland habitats. Bats, such as the pallid bat, may use hollows of larger, older oak trees for roosting in open-canopy oak woodland. The California myotis and long-eared myotis (*Myotis evotis*) may occur in areas of oak woodland with a closed canopy.

Open Water

Aquatic or open water habitats are permanently or semi-permanently flooded, and support less than 5 percent vegetation in emergent or submerged states. Isolated ponds, reservoirs, percolation ponds (off-stream groundwater recharge ponds), rivers, streams, canals, and ditches, and tidal/intertidal habitats represent the open water surfaces mapped in the Project Area. Such areas are described below in terms of the hydrologic regimes and the salinity of the water.

Ponds and Reservoirs

Very few naturally occurring ponds exist in the Project Area. Many human-made ponds, including old gravel excavation sites, stock ponds, or ornamental ponds associated with golf courses and parks, occur. Other water bodies in the Project Area include the Parkway Lakes, Lake Cunningham, Lake Almaden, and percolation ponds along Los Gatos, Llagas, Coyote, Upper Penitencia, Stevens, and Guadalupe creeks, the Guadalupe River, and Madrone Channel.

There are 10 reservoirs in the Project Area: Anderson, Calero, Chesbro, Coyote, Guadalupe, Lexington, Stevens Creek, Uvas, Vasona, and Almaden. These reservoirs were built to provide water supply and storage uses for county residents. Reservoirs have altered downstream hydrology by reducing spring runoff events, dampening flood peaks and frequency, and supplying water to creeks that would normally be dry during summer months. They also retain sediment, preventing natural sediment dispersal throughout the watershed. Although no Proposed Project activities would occur in the reservoirs, these reservoirs influence the biological resources present in reaches both above and below them.

Cormorants, gulls, and pelicans exhibit movements between foraging areas at inland reservoirs and the South Bay, and ospreys (*Pandion haliaetus*), Forster's terns (*Sterna forsteri*), and Caspian terns (*Sterna caspia*) forage for fish in a number of ponds and reservoirs in the Project Area. Since the late 1990s, small heron rookeries have become established on islands in inland reservoirs in the South Bay; these herons and egrets forage largely on fish in these waterbodies.

Amphibian species that breed in ponds and reservoirs throughout the Project Area include the Pacific chorus frog, bullfrog, and western toad. Western pond turtles are known to occur in a number of creeks including Coyote Creek, Guadalupe River, Alamitos Creek; ponds on the Santa Teresa Golf Course; several SCVWD reservoirs (Almaden, Calero, Chesbro, Anderson, Uvas, Stevens Creek, Lexington, etc.); and other small ponds throughout the

Project Area (H. T. Harvey & Associates 1999a, CNDDB 2011). This species may occur in creek, pond, and reservoir habitats throughout the Project Area, though in urban areas, nesting habitat is limited or absent. Several non-native turtle species have been introduced into the Project Area as well. California tiger salamanders are known to breed in several ponds at the periphery of the Project Area, and near Communications Hill, where non-instream aestivation habitat is available and non-native aquatic predators, such as bullfrogs, green sunfish (*Lepomis cyanellus*), mosquitofish (*Gambusia affinis*), and Louisiana red crayfish (*Procambarus clarkii*), are absent. California red-legged frogs are known from ponds and streams in a few areas at the periphery of the Project Area; however, this species is largely absent from the portions of the Project Area on the Santa Clara Valley floor that have been heavily impacted by urban development and agricultural activities (H. T. Harvey & Associates 1997).

Common resident birds that occur in ponds, lakes, and reservoirs throughout the Project Area include the pied-billed grebe (*Podilymbus podiceps*), double-crested cormorant (*Phalacrocorax auritus*), great egret, snowy egret (*Egretta thula*), Canada goose (*Branta canadensis*), mallard (*Anas platyrhynchos*), common merganser (*Mergus merganser*), American coot, and killdeer (*Charadrius vociferus*), among others. Numerous species of wintering ducks, such as the northern shoveler (*Anas clypeata*), lesser scaup (*Aythya affinis*), and bufflehead (*Bucephala clangula*) occur in these habitats during fall and winter. Shorebirds, such as the greater yellowlegs (*Tringa melanoleuca*), spotted sandpiper (*Actitis macularius*), and others, forage and roost at the edges of these habitats during migration and winter. Additionally, a variety of mammals come to ponds and reservoirs to drink.

The Coyote Creek Reach 1A pond along lower Coyote Creek was created and is managed specifically for waterbird use and provides habitat for numerous shorebirds, waterfowl, gulls, terns, and larger waders. Regular monitoring by the San Francisco Bay Bird Observatory of this 16-acre pond has recorded more than 57 species of waterbirds, the most common of which were dowitchers (*Limnodromus spp*.), American avocets (*Recurvirostra americana*), northern shovelers, and California gulls (Strong 2003). Additional birds using this pond include pectoral sandpipers (*Calidris melanotos*), western sandpipers (*Calidris mauri*), and Wilson's phalaropes (*Phalaropus lobatus*), as well as large numbers of nesting American avocets, black-necked stilts (*Himantopus mexicanus*), and ducks (Strong 2003).

Creek and Stream Channels

Creek and stream channels have been divided into three types for the purposes of the existing SMP: natural, mixed, and concrete. Natural channels are streams that have an unmodified bed and banks. Mixed channels have modified channels but have earthen stream-bottoms. The banks of mixed channels are often lined with excavated earth, rock rip-rap, gabions, concrete, or flood walls. Concrete-type channels are defined by concrete lining in the channel bed. Creek and stream channels may be vegetated with wetland vegetation, riparian vegetation, or open water, depending on the extent and type of modification applied.

Amphibians such as the western toad, Pacific chorus frog, and the non-native bullfrog also are present in creeks and stream channels in the Project Area. The native western pond

turtle is present in low numbers in some reaches of these streams, as are several species of non-native turtles that have been released locally from captivity, such as red-eared sliders and painted turtles (*Chrysemys picta*). Waterbirds, such as the mallard, green heron (*Butorides virescens*), great egret (*Ardea alba*), and belted kingfisher, forage in these waters. Bats, including the Yuma myotis (*Myotis yumanensis*) and big brown bat, forage aerially on insects over these streams.

A number of fish also use the creek and stream channels in the Project Area, including several species of native fishes. The rivers and creeks of Santa Clara County are home to 12 native and 24 non-native species of fish (SCVWD 1995, Leidy 2007). The most species-rich creek in terms of the number of fish species supported is Coyote Creek, with 12 native species (SCVWD 1995, Leidy 2007).

According to SCVWD fish sampling and relocation data (2002-2009) and Leidy (2007), the most common native fish in the Project Area streams draining to San Francisco Bay include the California roach (*Lavinia symmetricus*), hitch (*Lavinia exilicauda*), Sacramento sucker (*Catostomus occidentalis*), and threespine stickleback (*Gasterosteus aculeatus*), which occur in most watersheds and sub-watersheds in the Project Area. The federally threatened Central California Coast steelhead and the fall-run Chinook salmon are anadromous fish that spawn in several of these streams, such as Coyote Creek, Upper Penitencia Creek, the Guadalupe River, and Los Gatos Creek (SCVWD 2007a). The native Pacific lamprey (*Lampetra tridentata*) occurs in several streams in the Project Area. The creeks in the Pajaro River basin, which drain to Monterey Bay, support many of the same species as the creeks draining into San Francisco Bay. Dominant native fish species occurring in these creeks include species such as the Pacific lamprey, Monterey roach (*Lavinia symmetricus subditus*), hitch, pikeminnow (*Ptychocheilus grandis*), threespine stickleback, and riffle sculpin (*Cottus gulosus*), as well as the South-Central California Coast steelhead (Smith 1982).

A number of non-native fishes have been introduced to the Project Area, including the mosquitofish, largemouth bass (*Micropterus salmoides*), bluegill (*Lepomis macrochirus*), pumpkinseed (*Lepomis gibbosus*), green sunfish, common carp (*Cyprinus carpio*), goldfish (*Carassius auratus*), fathead minnow (*Pimephales promelas*), bigscale logperch (*Percina macrolepida*), inland silverside (*Menidia beryllina*), golden shiner (*Notemigonus crysoleucas*), and threadfin shad (*Dorosoma petenense*). Although fish in the Project Area's creeks consist of a mix of native and non-native species, most of the fish occurring in off-channel ponds and lakes are non-natives.

Canals

SCVWD-maintained canals (such as the Almaden Calero, Vasona, and Penitencia Canals) are used to divert water between streams or around certain stream reaches, or from one reservoir to another; canals also provide a flood protection benefit by intercepting hillside runoff. Some canals, such as the Coyote Alamitos Canal, Almaden Calero Canal, and portions of the Coyote Canal and Coyote Canal Extension, are concrete-lined and as a result support little riparian or wetland vegetation, other than vegetation that establishes on sediment that accumulates in the canals. As a result, dominant vegetation along these canals is determined primarily by the type of habitat (e.g., grassland or woodland) in which the canals have been constructed. Portions of the Coyote Canal and Coyote Canal Extension have natural earth

beds and banks, although little or no wetland or riparian vegetation (i.e., vegetation supported by groundwater associated with the canals) is present along these canals except where serpentine seeps drain into the canals. Among the canals in the Project Area, currently the Almaden Calero Canal, Vasona Canal, and Kirk and Page Distribution Systems are operable, whereas the Coyote, Coyote Extension, and Coyote Alamitos Canals are inoperable and are not used for water transfers or diversions, though these canals provide some flood protection benefit by intercepting runoff.

Fish from upstream areas may occur in perennially wet sections of the canals, and amphibians such as Pacific chorus frogs and western toads use portions of these canals for refuge and as breeding habitat. Ducks such as mallards forage in canals in low numbers, but waterbird use of these facilities is generally low.

Intertidal Areas

Mudflat habitat occurs in intertidal areas from below mean lower low water to mean tide level. Such intertidal areas are expanses of unvegetated mud just beyond the lower edge of tidal wetlands and between the low-flow channel and edge of wetlands within the tidal reaches of slough and creek channels that drain to San Francisco Bay. Mudflats generally are covered by shallow water during high tide, and are exposed during low tides. These are dynamic depositional features, changing in extent and location depending on erosion and deposition of sediments. Narrow mudflats occur along the edges of the upper reaches of tidal sloughs while much more extensive flats are present at the mouths of the major sloughs. For example, a large expanse of newly formed mudflat habitat exists at the mouths of Alviso Slough and Guadalupe Slough, while small areas of mudflat are surrounded by freshwater marsh at the upper end of Coyote Slough. This habitat often supports less than 10 percent cover of emergent vegetation, typically in the form of cordgrass and annual pickleweed (*Salicornia europaea*) that is too sparse to map as distinct salt marsh habitat.

Aquatic intertidal habitat is present in the Project Area in the lower, tidal reaches of streams entering the Bay. Such areas have tidal estuarine influence and are too deep to support low tidal salt marsh and cordgrass species. Depending on tidal action, such areas can range from relatively clear to extremely turbid. These habitats are more benthic in nature than mudflats and are not exposed, even during very low tides.

Detritus from tidal marshes, phytoplankton that settles in the water column, and algae and diatoms growing on the intertidal mudflats are responsible for the high productivity of benthic invertebrates on mudflats (Warwick and Price 1975, Life Science 2003). Crustaceans, polychaete worms, gastropod and bivalve mollusks, and other invertebrates live on or just below the surface of the mud. During the daily high tides, fish school over the mudflats to feed on these invertebrates. As the tide recedes and the flats emerge, the fish retreat to subtidal areas while considerable numbers of birds, primarily shorebirds, leave their high-tide roosts and feed on the flats. These mudflats are primarily responsible for the importance of the San Francisco Bay area to West Coast shorebird populations. Gulls and some dabbling ducks forage on the exposed mudflats as well. Because benthic invertebrates often recede deeper into the mud as the tidal elevation drops, especially large concentrations of foraging birds usually occur right at the edge of the receding or rising tideline. Although the largest numbers of shorebirds forage on the broad flats along the

edge of the Bay at low tide, some shorebirds, gulls, and large waders (e.g., herons and egrets) feed on the exposed flats along sloughs and channels, and the smaller channels in the brackish and salt marshes are the favored foraging areas for the state and federally endangered California clapper rail. Shorebirds, gulls, terns, American white pelicans (*Pelecanus erythrorhynchos*), and ducks often use exposed mudflats as roosting or loafing areas when they are available, as do Pacific harbor seals (*Phoca vitulina richardii*). When the tides rise, most of these birds return to roosting areas in salt ponds or other alternate habitats.

Invasive Species

For over two centuries, people have brought non-native plants and animals into the Project Area, either accidentally (e.g., as stowaways in cargo shipments) or intentionally (e.g., imported for food, ornament, sport, or as pets), and many of these species have now been introduced into the wild. Such species that cause harm and, once established, spread quickly from their point of introduction are often called "invasive" species.

Invasive species can threaten the diversity and abundance of native species through predation, competition for resources, transmission of disease, parasitism, and physical or chemical alteration of the habitat. Their effects on natural communities also may lead to direct effects on human activities, such as clogging waterways and water delivery systems, weakening flood protection structures, damaging crops, and diminishing sport fish populations (CDFG 2008c).

As described previously, invasive plant species, such as smooth cordgrass, perennial pepperweed, and giant reed, are common in the Project Area. Introduced animal species are also common in the Project Area. A few of the more common introduced/invasive wildlife and fish species present, or with a high potential to be introduced, are discussed next.

Mosquitofish have been introduced throughout the world, including Santa Clara County, to control mosquito populations. Such introductions have been shown to have negative effects on amphibians in experimental studies, including decreased survival of larval Pacific treefrogs (Goodsell and Kats 1999) and California newts (Gamradt and Kats 1996), as well as tail injury, reduced metamorph size, and altered activity patterns of larval California red-legged frogs (Lawler et al. 1999).

New Zealand mud snails (*Potamopyrgus antipodarum*), which reproduce rapidly and can crowd out the native insects that aquatic wildlife depend on for survival, were first discovered in California in 2000 in the Owens River in Mono County (CDFG 2008d). In New Zealand, populations likely are kept in check naturally by a native parasite that is not present in North America. In the absence of such natural predators or parasites, population densities can reach nearly 1 million snails per square meter, and the species is parthenogenic (i.e., able to start a new population from only one snail) (CDFG 2008d). Biologists do not believe that the species can be eradicated once established (CDFG 2008d). Although this species has not yet been recorded in the Project Area, it has been located to the north in Alameda County on Alameda Creek and to the south in Santa Cruz County on the San Lorenzo River (Benson 2011).

The American bullfrog has been accidentally and intentionally introduced (e.g., for food in the 1920s by commercial frog farmers) throughout the world and is now established throughout most of the western United States, including the Project Area (California Herps 2011). Their large size, mobility, generalized eating habits (their prey includes native amphibians as well as other aquatic and riparian vertebrates [Graber 1996]), and aggressive behavior have made bullfrogs extremely successful invaders and a threat to biodiversity (AmphibiaWeb 2008).

Non-native species such as feral house cats (*Felis felis*), red foxes, Norway rats, and muskrats are known to occur in the Project Area and are significant predators of native birds. For example, non-native Norway rats (*Rattus norvegicus*) have long been known to be effective predators of clapper rail nests (DeGroot 1927, Harvey 1980, Foerster et al. 1990), and according to Harvey and Foerster et al., predators, especially rats, has accounted for clapper rail nest losses of 24 to 29 percent in certain South Bay marshes.

Special-Status Plant and Animal Species

CEQA requires assessment of the effects of a project on species that are "threatened, rare, or endangered"; such species are typically described as "special-status species." For planning purposes during the SMP Update and for assessment of impacts of the Proposed Project, special-status species have been defined as described below. Impacts to these species are regulated by some of the federal and state laws and ordinances described under Section 3.3.2, *Regulatory Setting*.

Special-Status Plants

For the purposes of this document, "special-status" plants are considered plant species that are:

1. Listed under the FESA as threatened, endangered, proposed threatened, proposed endangered, or a candidate species.
2. Listed under the CESA as threatened, endangered, rare, or a candidate species.
3. Listed by the CNPS as rare or endangered on List 1A, 1B, or 2.
4. Listed by the CNPS on List 3 or 4.

For the purpose of this study, all special-status plants were analyzed for their potential to occur in the Project Area, and all those with the potential to occur were carried forward for additional analysis, except CNPS List 4 species were only carried forward if: 1) the only known populations occur in the vicinity of Santa Clara County; 2) it has been recorded by the CNPS (2011) as occurring in no more than two counties in California (i.e., very limited distribution); 3) populations in the Project Area are at the periphery of the species' range or in areas where the taxon is especially uncommon or has sustained heavy losses; 4) the type locality occurs in the Project Area; or 5) populations exhibit unusual morphology or occur on unusual substrates. Two CNPS List 4 species meet the above criteria because of their restricted range: Santa Clara red ribbons (*Clarkia concinna* ssp. *automixa*) and Satan's goldenbush (*Isocoma menziesii* var. *diabolica*).

Based on information from the CNPS and CNDDB (2011), a list of 94 special-status plants potentially occurring in Santa Clara County was compiled. After an analysis of documented habitat requirements and occurrence records for these species, 60 were determined to be absent from the Project Area. (A list of all species considered but rejected, and the reason for rejection is provided in Appendix G.) An additional two species were eliminated from consideration for species-specific reasons shown in Table 3.3-~~20~~21, located at the end of this section. The remaining 32 species are considered to occur potentially in the Project Area, based on their general habitat descriptions, also described in Table 3.3-~~20~~21. Detailed descriptions of each species potentially occurring in the Project Area and a discussion of known occurrences are provided in Appendix H and Table 3.3-~~20~~21.

Special-Status Animals

For purposes of this report, "special-status" animals are considered animal species that are:

- listed under the FESA as threatened, endangered, proposed threatened, proposed endangered, or a candidate species;
- listed under the CESA as threatened, endangered, or a candidate species;
- designated by the CDFG as a California species of special concern;
- listed in the California Fish and Game Code as a fully protected species (birds at Section 3511, mammals at Section 4700, reptiles and amphibians at Section 5050, and fish at Section 5515);
- protected by the Marine Mammal Protection Act;
- invertebrates that are on the CDFG's list of Special Animals (CDFG 2011) (although other taxa on that list are not included as special-status species in this analysis, if they do not meet one of the other criteria above, the invertebrates on the Special Animals list are considered special-status species here because no official list of invertebrate species of special concern exists); or
- Pacific lamprey, which could potentially be subject to listing under the state and/or federal Endangered Species Act during the period covered by this SMP update.

The legal status and potential for occurrence of special-status animal species known to occur or potentially occurring in the general vicinity of the Project Area are shown in Table 3.3-~~21~~22, located at the end of this section. Expanded descriptions are included in Appendix I for those species 1) known to occur in the Project Area, 2) for which potentially suitable habitat occurs within or in the general vicinity of the Project Area, 3) for which the site is accessible to animals from known populations, and/or 4) for which resource agencies and/or the Habitat Plan have expressed particular concern such that an expanded discussion is required.

Several special-status wildlife species that historically have occurred in the Project Area, or that have been recorded in Santa Clara County but not in the Project Area itself, are not expected to be present in the Project Area currently, at least not as special-status species. (Note: Several birds in this group are considered California species of special concern only when breeding [Shuford and Gardali 2008]. Thus, if they occur in the Project Area only as non-breeders [e.g., as migrants or winter visitors], they are not special-status species when they occur in the Project Area.) They include the following:

- The Central California Coast coho salmon (Oncorhynchus kisutch) was anecdotally reported to occur in Coyote Creek, and possibly in the Guadalupe River and Los Gatos Creek. However, it is unclear whether the species was ever actually present, as the life history of coho salmon is not conducive to its existence in South San Francisco Bay streams under either historical or current conditions. If it was ever present, it has been extirpated from these areas (Leidy et al. 2005, Spence et al. 2005).
- The silvery legless lizard (Anniella pulchra pulchra) was historically recorded in the northern San Jose portion of the Project Area, but no recent records exist. This species has been displaced by development or disturbed by agriculture in much of the Project Area, and a suite of other factors (e.g., off-road vehicle activity, erosion, livestock grazing, and the introduction of exotic plant species) has altered remaining habitat to the extent that the species is unlikely to occur in the Project Area.
- The willow flycatcher (Empidonax traillii) formerly nested commonly in riparian habitats on the Santa Clara Valley floor, but local populations were extirpated by the late 1960s. This species still occurs as an uncommon migrant in the Project Area, moving between wintering areas in Mexico and breeding areas to the north (Unitt 1987, Hunter et al. 2005). However, migrant willow flycatchers occurring in the Project Area are likely from breeding populations outside the state, and, thus, would not be individuals from the state-listed California population or the federally listed subspecies extimus that resides in riparian habitat of southern California (Unitt 1987).
- Yellow-headed blackbirds (Xanthocephalus xanthocephalus) historically nested in marshes on the Santa Clara Valley floor, but breeding has not been noted anywhere in Santa Clara County since 1925 (Bousman 2007a). This species currently occurs in the Project Area in small numbers, but only during migration. Because it is only considered a California species of special concern when nesting, it is not a special-status species when it occurs as a non-breeder in the Project Area.

Seven other bird species that are California species of special concern occur in the Project Area as non-breeding transients, foragers, or migrants, but they have never been recorded

breeding in or very close to the Project Area. These include the Barrow's goldeneye (*Bucephala islandica*), common loon (*Gavia immer*), American white pelican, western least bittern (*Ixobrychus exilis hesperis*), purple martin (*Progne subis*), black swift (*Cypseloides niger*), and black tern (*Chlidonias niger*). Because they are only considered species of special concern when nesting, they are not special-status species when they occur as non-breeding visitors to the Project Area.

Several bird species that are state or federally listed and consequently special-status species year-round also occasionally occur in the Project Area as non-breeding migrants, transients, or foragers, but they are not known or expected to breed, to occur regularly, or to occur in large numbers in the Project Area. These include the California condor, Swainson's hawk, California black rail, California least tern, least Bell's vireo, and bank swallow. These species are listed as threatened or endangered under the CESA and/or the FESA. Thus, they are considered special-status species even though they do not breed in the Project Area. Therefore, although these species occur in the Project Area only infrequently and/or in small numbers, they are discussed in further detail below. The willow flycatcher would be treated similarly to these species if the individuals that occur as migrants in the Project Area were from California breeding populations; however, because of the rarity of the species as a breeder in the state and the paucity of breeding pairs to the north of the Project Area, the probability that any California-breeding willow flycatchers migrate through the Project Area is extremely low.

A number of other special-status animal species are addressed in greater detail below because they 1) are known to breed or could potentially breed in the Project Area, 2) occur fairly commonly as non-breeders in the Project Area (and thus could potentially be substantially affected by activities that occur under the Proposed Project), 3) are described in the Habitat Plan as potentially occurring in the Project Area, 4) and/or are of particular concern to regulatory agencies. These include the Bay checkerspot butterfly, Pacific lamprey, green sturgeon, Central Valley fall-run Chinook salmon, Central California coast steelhead, longfin smelt, California tiger salamander, California horned lizard, California red-legged frog, foothill yellow-legged frog (*Rana boylii*), western pond turtle, black skimmer, California clapper rail, western snowy plover, northern harrier, white-tailed kite, golden eagle (*Aquila chrysaetos*), bald eagle, American peregrine falcon (*Falco peregrinus anatum*), long-eared owl (*Asio otus*), burrowing owl, Vaux's swift (*Chaetura vauxi*), olive-sided flycatcher (*Contopus cooperi*), loggerhead shrike, yellow warbler, San Francisco common yellowthroat, yellow-breasted chat, Alameda song sparrow, grasshopper sparrow, Bryant's savannah sparrow, tricolored blackbird (*Agelaius tricolor*), salt marsh wandering shrew, salt marsh harvest mouse, San Francisco dusky-footed woodrat, pallid bat, Townsend's big-eared bat (*Corynorhinus townsendii*), western red bat (*Lasiurus blossevillii*), ringtail (*Bassariscus astutus*), San Joaquin kit fox, American badger, and Pacific harbor seal.

Regulated and Sensitive Natural Communities

Waters, Streams, Lakes, and Other Waters of the U.S./Waters of the State

As described above under tidal salt marsh, tidal brackish marsh, freshwater wetlands, and open water, these habitats are extremely important in supporting numerous plant and wildlife species in the Project Area. Throughout California, the quality and quantity of aquatic and wetland habitat types has dramatically declined because of the construction of

dams, dikes, and levees as well as water diversions, the filling of aquatic and wetland habitat for development, and the overall degradation of general water quality caused by inputs of runoff from agricultural and urban development and other sources. As a result of their importance and the declines in these habitats that have occurred, aquatic and wetland habitat types are considered sensitive.

As described in Section 3.3.2, *Regulatory Setting*, many streams, lakes, and wetlands in the Project Area are regulated by the USACE as "waters of the U.S." and/or by the RWQCB as "waters of the state". The BCDC regulates impacts to wetlands and other waters within 100 feet of the BCDC-regulated shoreline band as well.

Riparian Habitats Regulated Under California Fish and Game Code

As discussed above, riparian plant and animal communities are extremely important to biodiversity and to the maintenance of biological and physical processes in the Project Area. However, these habitats have been degraded by a variety of factors, including the construction and operation of dams, realignment of streams and conversion to concrete-lined culverts, grazing and mowing, and population growth. In addition, historic groundwater overdraft has caused wetland and riparian loss throughout the region.

As described in Section 3.3.2, *Regulatory Setting*, the California Fish and Game Code includes regulations governing the use of, or impacts to, many of the state's fish, wildlife, and sensitive habitats, including the bed and banks of rivers, lakes, and streams.

Oak Woodlands

Oak woodlands are considered one of California's most productive and important natural communities. They support a rich plant and wildlife community; at least 60 of California's 169 terrestrial mammal species and approximately 60 species of birds are associated with oak woodlands (County of Santa Clara 2005). In addition, oaks play an important role in helping to maintain water quality in streams and rivers by reducing erosion. Yet more than a million acres of oak savannah and oak woodlands in California are estimated to have been lost since 1945 (County of Santa Clara 2005). Major factors contributing to the loss of oak woodlands include urban growth, conversion to agriculture, lack of regeneration of oak trees, and habitat fragmentation. As a result, numerous state and local agencies have established guidelines, regulations, and ordinances regarding the conservation of oak woodlands (e.g., Oak Woodlands Conservation Act [Fish and Game Code Section 1360-1372], Senate Bill 1334, and the Santa Clara County Oak Woodlands Management Plan [2005]).

CDFG Natural Communities of Special Concern

CDFG natural communities of special concern are those that are of limited distribution statewide or within a county or region. These communities may or may not contain special-status species or their habitat. Most types of wetlands and riparian communities are considered special-status natural communities because of their limited distribution in California. CDFG natural communities of special concern mapped within the Project Area include Northern Coastal Salt Marsh, Serpentine Bunchgrass, and Sycamore Alluvial Woodland (CDFG 2007).

Northern coastal salt marsh once occurred extensively in the tidally influenced lowlands surrounding San Francisco Bay. However, in the South Bay much of this habitat has been lost because of filling for development, landfills, and other uses; installation of flood protection structures which remove or mute tidal influence; and construction of levees to create managed ponds in areas that used to be extensive marshes. This community, which is located in tidal saline habitats at the extreme northern edge of the Project Area, supports a wide variety of plant and animal species specifically adapted to the dynamic hydrologic conditions and high salinity that occur within tidally influenced areas, including federally endangered species such as the salt marsh harvest mouse.

As described previously, serpentine bunchgrass generally supports native plant communities including rare plants, such as the federally listed Santa Clara Valley dudleya and Metcalf Canyon jewel-flower as well as most beautiful jewel-flower and smooth lessingia. Several invertebrate species, including the federally threatened Bay checkerspot butterfly, depend on serpentine grasslands because their host food plants are found primarily in these habitats. Likewise, serpentine outcrops/barrens, serpentine chaparral, and serpentine seeps are considered sensitive communities (ICF Jones & Stokes 2010) because of their importance to serpentine-endemic plants and invertebrates and their limited regional distribution. In the Project Area, serpentine communities occur primarily on either side of the Santa Clara Valley, from Coyote Ridge on the east and the Santa Teresa Hills on the west, south to the San Martin area. Smaller patches of serpentine grassland occur elsewhere, such as on Communications Hill, Tulare Hill, and north of Alum Rock in San Jose.

Central California sycamore alluvial woodland occurs along low, braided channels in areas with wide floodplains. The vegetation is dominated by California sycamore and the substrate tends to be cobbly or gravelly, scoured frequently by spring run-off events, and it supports a very sparse understory. Although sycamore alluvial woodlands were once more broadly distributed in California, they have experienced severe declines resulting from development of valley floors and changes in hydrology in suitable sites, typically caused by flood protection improvements along the drainages supporting sycamore stands. One study documented only 17 occurrences (comprising 2,032 acres) in the entire state (Keeler-Wolf et al. 1996). Sycamore alluvial woodland occurs sparsely in the Project Area, with the best examples of this community type occurring along Coyote Creek between U.S. Highway 101 and the Ogier Ponds and along Pacheco Creek.

3.3.4 Impact Analysis

Methodology

Impact Assessment. This impact analysis focused on potential effects of Proposed Project activities that may occur during 2012–2022. This evaluation does not assess the biological effects of the original construction of SCVWD's capital projects or prior (pre-2012) SMP activities. Rather, it evaluates the effects of proposed maintenance activities that are expected to occur over the next 10 years, compared to existing baseline conditions.

In general, the primary adverse effects of Proposed Project activities would occur during maintenance activities and the period immediately following maintenance activities.

Potential impacts are expected to include adverse effects on riparian, wetland, and instream habitats that would eventually restore themselves, impacts to associated plant communities and habitat of associated species, and potential degradation of water quality caused by herbicide use and releases of sediment. In some cases stream maintenance activities would result in long-term effects. Also, many shorter-term impacts would be repetitive, occurring a number of times during the 10-year period covered by the SMP Update.

Several characteristics of the Project and Project Area complicate the quantification of impacts to biological resources that would occur during 2012–2022. First, a specific reach of creek or canal may be subject to several types of activities, either simultaneously or in succession. For example, a reach may undergo sediment removal one year, followed by herbicide application the next year. Vegetation management activities also may target only instream areas, only non-instream areas (such as levees), or some combination of instream, bank/bench, and levee areas. The different combinations of Proposed Project activities that may occur along a specific reach of creek or canal complicate the quantification of impacts.

Further complicating the detailed quantification of impacts to biological resources in this analysis is the fact that maintenance activities may not occur exactly where they are projected. Experience from the 2002–2012 SMP indicates that some maintenance activities would be required in areas where they were not originally projected, and some reaches where activities were projected would not actually be subjected to maintenance. Furthermore, the total area in which SMP activities have occurred since 2002 has been substantially less than the projected impacts. Because of the impact avoidance and minimization that SCVWD employs through its BMPs, it is expected that actual impacts from 2012–2022 Proposed Project activities would be less than projected.

In addition, the projections for sediment removal and vegetation management activities do not specify precisely where within the projected reach maintenance activities would occur. Rather, these projections identify reaches of creek within which such activities are expected, as well as an estimated "work area percentage" indicating the percentage of that reach that would be affected by the specific activity. Because habitat conditions often vary within a reach, the precise effects of a specific activity within that reach can only be estimated at this time. The magnitude and location of impacts would be identified on an activity-by-activity basis as work was conducted, and the quantification those impacts would be refined and reported on an annual basis.

Finally, there are some areas where work activities were projected in 2001 for the period 2002–2012, and where activities are also projected for the period 2012–2022, but where the type and extent of activities may differ somewhat. For example, a reach subjected to manual vegetation management during the period 2002–2012 may undergo herbicide treatment during the period 2012–2022. In general, herbicide has less impact on vegetation than hand removal because ~~hand removal~~ herbicide application is targeted to specific individual plants. However, careful application of herbicide also is targeted and can reduce the effects on surrounding vegetation. Furthermore, hand removal makes it possible to remove larger diameter vegetation that fills a somewhat different ecological niche than herbicide application. To compound the difficulty of estimating the relative increase or decrease in the magnitude of the impacts resulting from these SMP Update activities, the projections in 2002 were based on linear extents and approximate widths while the 2012

projections were based on actually located polygons. Thus, a detailed comparison of the relative effects of these activities is infeasible.

As a result of these constraints, the approach taken to evaluate impacts to biological resources in this analysis and the approaches to be followed by SCVWD as its maintenance proceeds during 2012–2022 are as follows:

- This analysis describes qualitatively the types of impacts to biological resources that could occur as a result of 2012–2022 Proposed Project activities.
- This analysis broadly estimates the expected locations and potential magnitude of potential impacts, based on projections of sediment removal and vegetation management activities during 2012–2022, and based on experience from the 2002–2012 SMP. While the extent of work that is performed would likely be lower than the projections, based on experience during 2002–2012, it is also possible that the extent of work will be higher than projected. Significance determinations were based on these projections and estimates, and the type of and need for compensatory mitigation has been determined accordingly.
- Although the biological resources present in areas subject to SMP activities during the period 2002–2012 are often of lower quality than in areas where no recent maintenance has occurred, the discussion of the types of impacts that could result from proposed SMP activities during the period 2012–2022 applies to biological resources in all impact areas, regardless of whether or not work was performed in a given reach during the period 2002–2012. For example, if a given reach underwent manual vegetation management during the period 2002–2012, but would undergo both manual and herbicide vegetation management during the period 2012–2022, the discussions of potential impacts from both manual and herbicide treatment provided below would apply to the 2012–2022 activities. However, if any type of vegetation management was previously projected in that reach during the period 2002–2012, and thus in-perpetuity mitigation was already provided for impacts to that reach, no additional mitigation would be required for 2012–2022 vegetation management activities even though such activities may differ from those performed during the prior decade.
- During implementation of Proposed Project activities, SCVWD would refine the quantification of impacts to biological resources, such as the acreage of impacts to wetlands and riparian habitats, sensitive communities, or sensitive species' habitats. SCVWD would track these impacts annually, tallying the effects of Proposed Project activities for a specific year at the end

of the year. These refined impact calculations then would be used as the basis for determining mitigation that was to be provided at either that year's end or the following year. This annual mitigation analysis will clearly distinguish mitigation requirements for new work areas from areas where work was projected, and for which mitigation was already provided, during the period 2002–2012. Annual reports summarizing the impacts and associated mitigation needs would be submitted to the USFWS, NMFS, CDFG, USACE, and RWQCB.

Potential impacts on biotic resources from the Proposed Project were systematically evaluated at both the project level and cumulatively. These impacts were first evaluated without considering implementation of BMPs to describe qualitatively how Proposed Project activities could impact biotic resources. Then, the impacts were evaluated with application of the program BMPs. For those impacts that remained potentially significant even with BMP implementation, feasible mitigation measures were identified, and the significance of the impacts were then re-evaluated to determine if compensatory mitigation would reduce impacts to a less-than-significant level. Impacts that remained significant with implementation of compensatory mitigation are described as significant and unavoidable.

Biological resources would be affected not only by specific Proposed Project activities but also, in a few cases, by mitigation measures and BMPs. The net effect of these mitigation measures and BMPs would be beneficial. However, in a few cases, adverse effects may occur during implementation of these measures. For example, although relocation of steelhead and special-status reptiles and amphibians from work areas may be necessary to avoid mortality of those individuals, some injury or mortality may occur during relocation. As a result, the effects of the BMPs and the mitigation program also were analyzed where appropriate.

Mitigation Assessment. Many of the areas where activities are projected for 2012–2022 were similarly impacted during 2002–2012. In the impact assessments below, impacts that would be caused by continuing to conduct 2002–2012 maintenance activities over an additional period of 10 years (2012–2022) are distinguished from those caused by new activities, or activities in new areas where routine maintenance has not occurred in the past 10 years.

Compensatory mitigation, such as habitat restoration or preservation, has already been provided for impacts to areas where maintenance activities were projected for 2002–2012 period. For the 2002–2012 SMP, impacts from projected sediment removal and vegetation management activities on instream wetlands and riparian vegetation were mitigated through an "up front" or defined mitigation package based on the maximum work projections estimated in 2001. However, the actual amount of maintenance work conducted during 2002–2012, and the associated impacts, have been less than projected. For example, to date the actual sediment removed (371,292 cubic yards) is only about 47 percent of the originally projected sediment removal volume of 795, 600 cubic yards. As a result, mitigation provided for the 2002–2012 SMP has exceeded, or will exceed once the mitigation has been completed, proposed 2002–2012 activities.

Impacts from non-projected maintenance activities, such as bank stabilization activities, during 2002–2012 have been mitigated on an "as-needed" basis, using defined mitigation ratios as maintenance activities occurred.

Because the 2002–2012 SMP will have mitigated potential impacts from projected sediment removal and vegetation management, whether they actually occurred or not, this analysis does not propose any additional compensatory mitigation for 2012–2022 activities that would occur in areas where previous maintenance activities were projected in 2002. The 2012–2022 SMP Update identifies projected activities in channel reaches that were not previously identified or projected in 2002. These "new" work areas were not accounted in the 2002 SMP FEIR mitigation. After implementation of the SCVWD's BMPs, if residual impacts from maintenance activities in new work areas remained potentially significant, compensatory mitigation is prescribed that would reduce impacts to less-than-significant levels where feasible. This analysis describes the type(s) of compensatory mitigation that would be required and discusses how the amount of required mitigation would be determined. As described previously, SCVWD would refine the quantification of impacts and mitigation requirements on an annual basis, for annual review by resource agencies.

The mitigation package, described in Appendix C, is designed to compensate for many of the residual impacts of the Proposed Project. The residual impacts associated with vegetation management and sediment removal activities would be temporary in nature—vegetation that was managed and wetlands and other waters affected by sediment removal would restore naturally if management were to cease. However, the repetitive nature of many SMP Update activities, which would not allow for regeneration of these resources if management occurred frequently, would result in longer-term effects. Permanent impacts associated with the SMP Update would occur with streambank stabilization activities when bank-hardening treatments were applied, as vegetation and habitats would not naturally restore themselves following the cessation of bank stabilization activities. As described in Appendix C, the mitigation for bank stabilization would occur on an as-needed basis.

General Discussion of Impacts of Proposed Activities on Biological Resources

The following sections describe generally how bank stabilization, sediment removal, vegetation management, and management of animal conflicts may impact different types of biological resources. These discussions are detailed here, rather than in the individual (e.g., species-specific) impact discussions that appear later in this document, to avoid redundancy. For example, the general discussions of how SMP Update activities may affect birds would apply to the more species-specific impact sections on the least Bell's vireo, yellow warbler, yellow-breasted chat, burrowing owl, golden eagle, bald eagle, and other birds. Thus, the species-specific impact sections reference the general discussions included below, then go into more detail regarding species-specific impacts, as appropriate.

Minor maintenance activities, which are described in Section 2.2.4, may occur throughout the Project Area, and 100–200 minor maintenance activities currently occur each year. Any minor maintenance activity typically would affect only a very limited area and, therefore, impacts to biological resources likewise typically would be limited in extent. Nevertheless, minor maintenance activities may have impacts similar to those that would result from bank stabilization, sediment removal, vegetation management, and management of animal

conflicts. Therefore, the discussions of how bank stabilization, sediment removal, vegetation management, and management of animal conflicts would affect biological resources pertain to similar minor maintenance activities, and the effects of minor maintenance activities on these resources would be tracked by SCVWD for mitigation purposes, just as would occur for the other activities. Minor maintenance also would include limited road repair and grading, which could occur at any location in the Project Area.

Bank stabilization, sediment removal, vegetation management, management of animal conflicts, and minor maintenance could each occur, and some are projected to occur, along canals. Therefore, the effects of bank stabilization, sediment removal, vegetation management, and management of animal conflicts discussed below would apply to areas where those activities may occur along natural channels or canals. More detailed discussion of impacts from SMP Update activities along canals is provided where impacts to a certain biological resource are expected to occur disproportionately along canals.

Determination of Impacts to Aquatic and Wetland Communities

This section describes the general approach used to determine impacts on aquatic and wetland communities, including areas that are considered jurisdictional waters of the U.S. or waters of the state.

Types of Impact

Proposed Project activities may affect aquatic and wetland communities through direct or indirect disturbance of vegetation and disturbance, modification, or destruction of habitat. The types of potential impacts that were considered in this evaluation, grouped by maintenance activity type, are described below.

Bank Stabilization

Bank stabilization activities (e.g., grading to remove undercut banks and installation of bank armoring) and subsequent changes in hydrology may result in changes to the extent of wetland and aquatic communities present in a work site. Wetland vegetation may be lost as a result of mechanical or physical clearing in the work site (including access areas) and damage to vegetation may occur as a result of crushing by equipment; trampling by personnel; and compaction of soil, which could result in damage to plant roots. Some bank stabilization activities would require temporary water diversions or dewatering. This activity would result in the temporary loss of aquatic and wetland communities and may result in increased turbidity within and downstream from the footprint of the activities caused by mobilization of fine sediments. In addition, because barren slopes are more susceptible to erosion from incident rainfall, the loss of wetland vegetation and non-instream vegetation along stream banks following bank stabilization activities may result in an increase in erosion and sedimentation. Increased erosion and sedimentation may lead to the filling in of pools and damage to wetland vegetation. Bank stabilization also may affect downstream areas by altering flow patterns.

Sediment Removal

As sediment is removed, so is any vegetation that is growing on it, including freshwater and tidal wetland vegetation. Removal of wetland vegetation may result in the loss of

propagules for colonization of downstream areas. Additionally, similar to bank stabilization, some sediment removal activities would require temporary water diversions or dewatering. This activity would result in the temporary loss of aquatic and wetland communities and may result in increased turbidity caused by mobilization of fine sediments. Wetland vegetation also may be damaged by equipment accessing sediment removal sites.

Vegetation Management

In-channel vegetation management involves the foliar application of herbicide to targeted vegetation (e.g., plants with stems 2 inches diameter at breast height [dbh] or less) or the hand removal, mowing, or pruning of such vegetation (along with follow-up herbicide treatment of cut stumps). Target vegetation primarily consists of herbaceous annual and perennial emergent wetland vegetation, such as cattails and bulrush, or woody vegetation consisting of native riparian species, such as willow and box elder, and non-native species, such as eucalyptus. "Limbing up," which entails removal of woody understory vegetation and the lower branches of taller trees, occurs along the slopes of levees that must be maintained to USACE-mandated standards. Vegetation management includes large woody debris relocation or removal, non-native invasive plant removal, and removal of trees up to 12 inches dbh. Removal of trees larger than 12 inches dbh is not included in the SMP Update. Vegetation removal could result in increased scour caused by the loosening of sediment deposits, not only as a result of the removal of vegetation but also from accelerated flows.

Management of Animal Conflicts

Discharge of sediments into the channel as a result of ground-disturbing activities on levee surfaces (e.g., filling or compacting of crevices/holes) may result in the filling of pools as well as adverse effects on wetland vegetation. Regrading and recompacting the levee surface, as well as the installation of surface barriers, may require the removal of vegetation or may limit new vegetation growth caused by soil compaction and loss of accessible surface growing space.

Quantification of Impacts

Direct impacts on aquatic and wetland communities were evaluated by determining the quantity (e.g., in acreage or linear miles, as projections data was available) of projected sediment removal and vegetation management impacts to creek reaches potentially supporting these communities.

Determination of Impacts to Non-Instream Sensitive Plant Communities

This section describes the approach used to determine impacts on non-instream sensitive plant communities as defined under the Regulated and Sensitive Natural Communities discussion above.

Types of Impact

Proposed Project activities may affect non-instream sensitive plant communities through direct or indirect disturbance of vegetation and disturbance, modification, or destruction.

The types of potential impacts that were considered in this evaluation, grouped by maintenance activity type, are described next.

Bank Stabilization

Bank stabilization activities may impact non-instream sensitive plant communities through temporary loss and degradation of the community (e.g., soft armoring of the bank, creation of temporary staging areas and access routes, alteration of hydrology on levee tops and upper side slopes through compaction, alteration of surface drainage patterns caused by movement of heavy equipment or soil disturbance, and introduction of non-native species) or permanent loss of the community (e.g., hard armoring of the bank). Vegetation may be lost as a result of mechanical or physical clearing in the work site (including staging and access areas), and damage to vegetation may occur as a result of equipment use, trampling by personnel, and compaction of soil, which could result in damage to plant roots or stems. Such impacts may lead to the alteration of the communities' species composition, structure, and function.

Furthermore, maintenance activities (including bank stabilization) often include the refueling of equipment on-site. Minor fuel and oil spills may occur during refueling, with a risk of larger releases. Without rapid containment and clean up, these materials may kill or impair the health of plants.

Sediment Removal

Because sediment removal would be limited to the stream channel, direct disturbance to upland plant communities would occur primarily through the establishment of staging and access areas in such communities. The concomitant operation of equipment in non-instream areas during sediment removal activities also may result in impacts to sensitive upland plant communities, similar to those described for bank stabilization activities.

Vegetation Management

The Proposed Project would include several methods of vegetation management activities, including mowing, hand removal, and herbicide application. Such activities may impact sensitive upland plant communities as a result of mechanical, physical, or chemical (i.e., herbicide) removal of vegetation, which could result in the alteration of the communities' species composition, structure, and function. In addition, the creation of temporary access routes and staging areas may result in direct impacts on sensitive upland plant communities caused by mechanical or physical removal of vegetation, crushing by equipment trampling by personnel, compaction of soil, and alteration of hydrology through compaction or alteration of surface drainage patterns resulting from movement of heavy equipment or soil disturbance.

Management of Animal Conflicts

Animal conflict management activities may impact sensitive upland plant communities as a result of the disturbance of the soil surface, collapsing and filling of burrows, installation of surface treatments to inhibit burrowing, and control of burrowing mammal populations that are a component of some sensitive upland communities, such as serpentine grasslands. Impacts may include direct removal or damage of vegetation; compaction of soil, which

could result in damage to plant roots; trampling by personnel; alteration of hydrology through compaction or alteration of surface drainage patterns; and exposure to toxic chemicals (e.g., petroleum products).

Quantification of Impacts

Direct impacts on sensitive upland plant communities were evaluated by comparing the quantity and quality of communities present in the Project Area under baseline conditions to anticipated conditions after implementation of the proposed stream maintenance activities. For this evaluation, direct impacts on sensitive upland plant communities were assessed based on the potential for disturbance, degradation, or loss of communities as a result of projected activities.

Determination of Impacts to Special-Status Plants

The impact assessment for special-status plants was developed using general life history and habitat requirements. The impact analysis considered how each of the Proposed Project activities (i.e., sediment removal, vegetation management, bank protection, management of animal conflicts, minor maintenance, and canal maintenance) could affect each of the special-status plants identified as potentially occurring in the Project Area. The significance of impacts then was determined, based on the criteria discussed next.

Types of Impact

Proposed Project activities may affect special-status plants through direct or indirect disturbance of populations and disturbance, modification, or destruction of suitable habitat. The types of potential impacts that were considered in this evaluation, grouped by maintenance activity type, are described as follows.

Bank Stabilization

Bank stabilization activities may impact special-status plants through temporary loss and degradation of suitable habitat (e.g., soft armoring of the bank, creation of access routes, alteration of hydrology through soil compaction, alteration of surface drainage patterns resulting from movement of heavy equipment or soil disturbance; and introduction of non-native species) or permanent loss of habitat (e.g., hard armoring of the bank). In addition, individual plants and populations may be lost as a result of mechanical or physical removal of vegetation in the work site (including staging and access areas), and damage to special-status plants may occur as a result of crushing by equipment; trampling by personnel; and compaction of soil, which could result in damage to plant roots. These activities could result in death, altered growth, or reduced seed set through physically breaking, crushing, wilting, or uprooting plants.

Furthermore, maintenance activities (including bank stabilization) often include the refueling of equipment on location. Minor fuel and oil spills may occur during refueling, with a risk of larger releases. Without rapid containment and clean up, these materials may kill or impair the health of special-status plants.

Sediment Removal

As sediment is removed, so is any vegetation that is growing on it, including special-status plant species. Because suitable habitat for only a single special-status plant species (Mt. Hamilton thistle) occurs within the stream channels, sediment removal is expected to result in the removal of few special-status plants. However, the operation of equipment in non-instream areas during sediment removal activities may result in damage to special-status plants by personnel and equipment; compaction of soil; alteration of hydrology through compaction or alteration of surface drainage patterns; removal of propagules for colonization of other areas; and exposure to toxic chemicals (e.g., petroleum products).

Vegetation Management

Vegetation management activities may result in the alteration of habitat (including the introduction of non-native species) and/or direct damage and mortality of special-status plant individuals or populations as a result of mechanical or physical removal of vegetation or off target herbicide contact via drift. In addition, the creation of temporary access routes and staging areas may result in direct impacts on special-status plant species as a result of mechanical or physical removal of vegetation; trampling by personnel and equipment; compaction of soil caused by movement of heavy equipment or soil disturbance; removal of propagules for colonization of other areas; and exposure to toxic chemicals (e.g. petroleum products).

Management of Animal Conflicts

Animal conflict management activities would include the destruction of rodent burrows on levees and slopes. Special-status plants may be directly impacted by burrow filling and compaction activities, which would involve disturbance of the soil surface, collapsing and filling of burrows, and subsequent soil compaction. Installation of surface treatments to inhibit burrowing by mammals also may affect special-status plants in the treated area, and control of populations of burrowing mammals may adversely affect the disturbance regimes of plant communities that support special-status plants. Impacts may include direct removal of vegetation to access and remove the burrows, compaction of soil, trampling by personnel, alteration of hydrology through compaction or alteration of surface drainage patterns, and exposure to toxic chemicals (e.g. petroleum products).

Quantification of Impacts

For this evaluation, impacts on special-status plants were assessed based on the potential for the species or their habitat to be disturbed during stream maintenance activities. Impacts on special-status plants were evaluated by comparing the quantity and quality of habitat present in the Project Area under baseline conditions to anticipated conditions after implementation of Proposed Project maintenance activities, and by considering the potential for individual activities to affect known and potentially occurring populations of these species.

Determination of Impacts to Wildlife and Fisheries

The impact assessment for wildlife and fisheries was developed using general life history and habitat requirements for each of the five vertebrate classes (i.e., fish, amphibians, reptiles, birds, and mammals) and invertebrate groups (e.g., insects). The impact analysis looked at each of the project components (i.e., sediment removal, vegetation management,

bank protection, management of animal conflicts, and minor maintenance), broken down by location and stream conditions, and evaluated how each of the major taxa would be affected by these work components. The significance of impacts then was determined based on the criteria discussed next. The following discussion applies to all fish and wildlife species and communities, including common and special-status species.

Types of Impact

Proposed Project activities may affect animals through direct or indirect disturbance of individuals and populations and disturbance, modification, or destruction of habitat. The types of potential impacts that were considered in this evaluation, grouped by maintenance activity type, are described next.

Bank Stabilization

Fish. The effects of bank stabilization on fish depend on the community supported in the reach where the activity occurs, the habitat present at the site, and the type of bank stabilization installed. Important habitat values for fish that may be affected by proposed bank stabilization activities would include effects on riparian shrubs and trees, instream and overhanging escape cover, and sedimentation.

Riparian vegetation is important in determining the structure and function of instream habitat. For example, overhanging riparian vegetation provides shade that moderates stream temperatures. Unusual stream temperatures can lead to disease outbreaks and altered timing of migration (USDA Forest Service 1979), and excessive summer temperatures can be lethal to salmonids and their invertebrate prey species. Furthermore, terrestrial insects that occur in riparian vegetation are an important food item for salmonids, entering stream channels as a result of being blown or washed off riparian vegetation. In addition, plant material that falls into streams is an important food source for aquatic insects, which in turn are fed on by fish (USDA Forest Service 1979; Knight and Bottorff 1984).

Repeated removal of smaller trees would prevent them from growing into larger trees, and thus over the long term, Proposed Project activities could reduce the input of large woody debris into streams and reduce the development of extensive root systems that would provide additional instream complexity. Over the course of the 10-year SMP Update (2012–2022), such impacts would be limited by the extent to which 10 years' growth could substantially change habitat conditions or the contribution that individual trees could make to fish habitat. However, vegetation management would reduce the number of trees that grew tall enough to provide such habitat complexity resources to streams. Such complexity would be important to fish by encouraging the development of riffle/pool complexes, which would be important to steelhead spawning and feeding, and would provide refugia from predators and high flow velocities. Thus, bank stabilization activities that resulted in the loss of riparian vegetation (e.g., grading to remove undercut banks and clearing of vegetation before the installation of bank armoring) may adversely affect fish as a result of increased water temperatures and reduced food availability. The grading and armoring of undercut banks and the removal of overhanging vegetation and associated roots protruding from eroding banks also may adversely affect fish habitat by reducing the availability of instream escape cover.

Although the loss of organic matter associated with vegetation that was removed could affect the aquatic food web, a benefit would occur to thinning of vegetation in areas that were formerly densely shaded. The presence of dams along most SMP-maintained streams likely has resulted in significant shifts in vegetation type and density over time along the stream reaches below the dams. Without heavy flushing flows during winter storms, vegetation has encroached on the channel, reducing channel width and, in many areas, densely shading the channel. In Uvas Creek, a study by Casagrande (2010) found that steelhead grew much more quickly, and thus were much larger by their first winter, at less shaded, somewhat warmer sites, which had higher prey abundance, than at densely shaded, cooler sites. Casagrande (2010) verified that invertebrate biomass was considerably higher at less heavily shaded sites than under a dense forest canopy. His findings confirm those of other studies, demonstrating greater stream productivity (Murphy et al. 1981, Bilby and Bisson 1992, Quinn et al. 1997, Ambrose et al. 2004) and greater salmonid production (Wilzbach et al. 1986, 2005; Nislow and Lowe 2006) along reaches with lower canopy closure and higher light levels. Fish sampling by SCVWD in reaches below dense canopy has found very low densities of fish (of any species), apparently as a result of very low food densities (M. Moore, unpublished data). Therefore, thinning of vegetation as a result of the SMP Update's vegetation management component may have considerable benefits to steelhead and other fish by increasing prey abundance in areas that are currently heavily shaded.

The loss of riparian vegetation on channel banks following bank stabilization activities also may result in an increase in erosion and sedimentation. Stream bank erosion is a natural process that can be beneficial to fish by providing a source of the boulders, cobble, and gravel necessary for high quality salmonid spawning, rearing, and overwintering habitat. However, when natural levels of erosion are exceeded, sedimentation may have adverse effects on salmonid habitat by filling in spaces between gravels and cobbles. This embedding of gravels can impede intragravel flow, which is important for delivering oxygen to incubating eggs; create an impenetrable barrier that prevents the emergence of fry from their gravel nest; and decrease the amount of available habitat for overwintering steelhead, which use interstitial spaces in cobble or boulder substrate during winter periods of inactivity to reduce their exposure to predation and as refuge from downstream displacement during high velocity flows (Bustard and Narver 1975, Stillwater Sciences 2006). Increases in turbidity and sediment input also may cause stress to fish because of feeding difficulties or displacement. Minor spills of petrochemicals, hydraulic fluids, and solvents may occur during vehicle and equipment refueling or as a result of leaks, adversely affecting water quality and potentially killing or injuring fish. Similarly, contact by uncured concrete with water could release chemicals that could impair the health of fish.

In accordance with its BMPs, SCVWD would capture and relocate steelhead before the initiation of bank stabilization activities that would require temporary water diversions or dewatering. During relocation operations, steelhead would be subject to harassment, pursuit, capture, mortality, and related stresses associated with netting and electrofishing. In addition to direct injury and mortality, the effects of electrofishing may include reduced growth rates of injured fish for at least a year following the electrofishing event (Dalby et al. 1996; Ainslie et al. 1998). Fish that were not relocated and that remained within the work site may be subjected to degraded water quality, temporary blockage of migration, stranding in isolated pools, and mortality as a result of maintenance activities.

Soil and groundwater in the Guadalupe River watershed contain potentially hazardous levels of mercury contamination (see Section 3.6, *Hazards and Hazardous Materials*). Maintenance activities involving ground disturbance, such as sediment removal and bank stabilization, may expose the mercury and potentially release it into the environment. Mercury is a toxic constituent that bioaccumulates in the food chain of aquatic organisms and terrestrial wildlife. Effects of methylmercury exposure on wildlife can include mortality, reduced fertility, slower growth and development and abnormal behavior that affects survival, depending on the level of exposure (Scheuhammer et al. 2007, USEPA 2010).

Certain activities proposed under the SMP Update (e.g., bank stabilization and sediment removal) may require the construction of coffer dams to temporarily dewater the affected channel and minimize impacts on water quality. Coffer dams may be constructed of inflatable dams, sand bags, or possibly fiberglass sheet piles that could be pushed into place (rather than hammered into place).

Bank stabilization activities often necessitate the operation of heavy equipment within the stream bed (after dewatering). Movement of heavy equipment may compact the substrate, potentially killing benthic invertebrates (which may serve as prey for fish), embedding gravel within finer sediments, and otherwise altering habitat for fish and their prey.

Amphibians and Reptiles. Potential direct effects on amphibians and reptiles as a result of bank stabilization activities could include injury or mortality of individuals by equipment, vehicle traffic, and worker foot traffic and disturbance of emergent vegetation, boulders, or cobbles that would support egg masses. In addition, because most reptiles and amphibians are oviparous (egg-laying), destruction of eggs/nests also could occur during maintenance activities. Furthermore, petrochemicals, hydraulic fluids, and solvents that were spilled or leaked from vehicles or equipment may kill individuals at any life stage, and increased sediment deposition may suffocate embryos and tadpoles. Special-status amphibians and reptiles that were found during pre-construction surveys and relocated to suitable habitat outside of the work site may be subjected to physiological stress and greater risk of predation.

Fossorial (burrowing) species and species that use existing animal burrows as refugia (e.g., Pacific tree frogs, western toads, western fence lizards, California newts [*Taricha torosa*], ensatina [*Ensatina eschscholtzii*], California tiger salamanders, California red-legged frogs, western skinks, gopher snakes) may be crushed in their burrows by the passage of heavy equipment or trapped and suffocated. Furthermore, loss of subterranean habitat (i.e., burrows) as a result of grading and bank armoring may result in the displacement of small mammals and invertebrates that would serve as a food source for some species of amphibians and reptiles. Additionally, where "hard" bank stabilization methods were used, bank protection could result in the loss of foraging, nesting, and overwintering habitat by precluding the re-establishment of riparian vegetation.

Daily movements throughout their home range may be temporarily affected during maintenance activities as a result of dewatering or disturbance of non-instream habitat. Seasonal movements (i.e., breeding, aestivation) also may be affected, depending on the timing and duration of activities.

Substrate vibrations or sounds may cause individuals to move out of refugia, exposing them to a greater risk of predation or desiccation, and may interfere with predator detection, causing a decrease in time spent foraging. Additionally, increases in human concentration and activity in the vicinity of suitable habitat may result in an increase in native and non-native predators that would be attracted to trash left in the work site. For example, raccoons, American crows (*Corvus brachyrhynchos*), and ravens (*Corvus corax*) would be attracted to trash and also would prey opportunistically on amphibians.

As discussed above, bank stabilization activities in the Guadalupe River watershed may expose soils contaminated with mercury. Effects of methylmercury exposure on wildlife could include mortality (death), reduced fertility, slower growth and development, and abnormal behavior that affects survival, depending on the level of exposure (Scheuhammer et al. 2007, USEPA 2010).

Birds. Birds that foraged or roosted in the work site would be affected while heavy ground disturbance, noise, and vibration caused by the work activity proceeded. Individuals of these species (especially eggs or young in nests) could be killed or injured during maintenance activities by personnel or equipment. Maintenance activities causing a substantial increase in noise, movement of equipment, or human presence near active nests could result in the abandonment of nests, and possibly the loss of eggs or young as a result. In addition, increased human activity may affect the behavior of birds, causing them to avoid work sites and possibly exposing them to increased competition with other birds in the areas to which they dispersed and increased levels of predation caused by unfamiliarity with the new area. Increases in human concentration and activity associated with maintenance in the vicinity of suitable habitat also may result in an increase in native and non-native predators that would be attracted to trash left in the work site and a reduction in the quality of breeding or foraging habitat caused by the introduction of non-native vegetation.

Clearing and grading may result in the temporary or permanent loss of breeding and/or foraging habitat. In addition, increased sedimentation or hazardous material spills from maintenance activities may result in the temporary or permanent degradation of water quality and, hence, habitat quality in marsh or aquatic habitats downstream from work sites and could impact aquatic and riparian bird species.

As discussed above, bank stabilization activities in the Guadalupe River watershed may expose soils contaminated with mercury. Birds fed inorganic mercury show a reduction in food intake and consequent poor growth, with other reported effects including increased enzyme production, decreased cardiovascular function, blood parameter changes, immune response, changes in kidney function and structure, and behavioral changes) (Boening 2000, Scheuhammer et al. 2007, USEPA 2010).

Mammals. During bank stabilization activities, smaller mammals may be crushed or injured by personnel or equipment. Furthermore, species that seek safety in burrows (mice, skunks, squirrels) could be killed or entombed in collapsed burrows. Larger, more mobile mammal species, such as deer, canids, and bobcats, and some smaller mammals would vacate the area, potentially exposing them to increased competition from conspecifics already

occupying the area to which they were displaced and increased levels of predation because of unfamiliarity with the new area or lack of sufficient refugia.

As discussed above, bank stabilization activities in the Guadalupe River watershed may expose soils contaminated with mercury. Effects of methylmercury exposure on wildlife can include mortality (death), reduced fertility, slower growth and development, and abnormal behavior that affect survival, depending on the level of exposure (Scheuhammer et al. 2007, USEPA 2010).

Invertebrates. Invertebrates occur in and adjacent to channels where bank stabilization activities are planned. In these areas, invertebrates could be either killed directly (e.g., by crushing) or adversely affected by the loss of host plants or disturbance of refugia. For species such as moths and butterflies, host plants may be damaged or killed as a result of work site clearing (e.g., before the installation of bank armoring or during the creation of access roads or staging areas), crushing by equipment, trampling by personnel, and soil compaction by heavy equipment. In addition, these species may be adversely affected by habitat conversion, which could result from the unintentional introduction of non-native grasses and forbs to work sites. Bank stabilization activities often necessitate the operation of heavy equipment within the stream bed (after dewatering). Movement of heavy equipment may compact the substrate, potentially killing benthic invertebrates, embedding gravel within finer sediments, and otherwise altering habitat conditions.

Sediment Removal

Fish. Sediment removal activities (e.g., sediment removal, access road construction, and staging area construction) may result in the removal of instream emergent vegetation and riparian vegetation along the channel banks, resulting in impacts similar to those described for loss of riparian vegetation as a result of bank stabilization activities. The removal of instream vegetation and riparian habitat may adversely affect fish as a result of increased water temperatures and reduced food availability. Additionally, the loss of instream cover, such as rocks, vegetation, and large woody debris, may adversely affect fish as a result of increased predation caused by a decrease in the availability of escape cover and the alteration of local hydraulics (e.g., increasing water velocity), which could reduce the frequency of riffle and pool habitat (Stillwater Sciences 2006), and the loss of refugia during high flows. Sediment removal also would result in the loss of substrate used by various fish for foraging or spawning, most notably the removal of spawning gravel for salmonids.

As discussed under bank stabilization above, increased sedimentation may have adverse effects on salmonid spawning and overwintering habitat by filling in spaces between gravels and cobbles. Increases in turbidity and sediment input also may cause stress to fish because of feeding difficulties or displacement. Furthermore, settling of silt disturbed by sediment removal activities and contouring and grading of the channel following sediment removal may degrade spawning or rearing habitat in or downstream from work sites.

As discussed for bank stabilization activities, SCVWD would capture and relocate native fish in accordance with its BMPs before the initiation of sediment removal activities that require temporary water diversions or dewatering along steelhead streams. During relocation operations, steelhead would be subject to harassment, pursuit, capture, mortality, and

related stresses associated with netting and electrofishing. Furthermore, fish that were not relocated and that remained within the work site may be subjected to degraded water quality, temporary blockage of migration, stranding in isolated pools, and mortality as a result of maintenance activities.

Other effects of sediment removal on fish would be similar to those described above for bank stabilization. These would include the potential for fish injury or mortality during relocation efforts and adverse effects of fuel or chemical spills and mercury mobilization.

However, the removal of sediment also may result in beneficial impacts on the ability of fish to move along streams, particularly for salmonids to migrate between estuarine areas and upstream spawning and rearing habitats, by improving upstream and downstream access.

Amphibians and Reptiles. Similar to the potential direct effects of bank stabilization activities described above, potential impacts of sediment removal activities on amphibians and reptiles would include injury or mortality of individuals by equipment, vehicle traffic, and worker foot traffic; disturbance of boulders or cobbles that support egg masses; destruction of eggs/nests; silting over of eggs or tadpoles; exposure to petrochemicals, hydraulic fluids, and solvents; disruption of daily or seasonal movements; loss of basking sites and vegetative cover; exposure to mercury; disruption of foraging as a result of vibrations or seismic sounds; and exposure to increased numbers of predators. Furthermore, special-status amphibians and reptiles that were found during pre-construction surveys and relocated to suitable habitat outside of the work site may be subjected to physiological stress and be at greater risk of predation, and dewatering activities may result in a temporary loss of habitat, blockage of movement, and stranding or death of frog eggs and tadpoles.

Birds. Similar to the potential effects of bank stabilization activities described above, potential impacts of sediment removal activities on birds would include mortality or injury of adults or eggs/young in nests as a result of crushing by equipment; nest abandonment because of increased noise and disturbance; exposure to increased competition as a result of displacement; exposure to increased numbers of predators; and increased exposure to mercury.

The removal of instream vegetation associated with sediment removal activities may result in the temporary loss of habitats that served as breeding and/or foraging habitat, both in the sediment removal area and in access and staging areas. In addition, increased sedimentation or hazardous material spills from maintenance activities may result in the temporary or permanent degradation of water quality and, hence, habitat quality in marsh or aquatic habitats downstream from work sites and could impact habitat used by aquatic and riparian species.

Mammals. Similar to the potential direct effects of *Bank Stabilization* activities described above, potential impacts of sediment removal activities on mammals would include mortality or injury by personnel or equipment; exposure to increased competition from conspecifics as a result of displacement; exposure to increased levels of predation because of unfamiliarity with the new area, lack of sufficient refugia, or increased numbers of predators; and exposure to increased levels of mercury. These effects would occur primarily

in non-instream staging and access areas and would be limited in the sediment removal area itself, as most mammals in the Project Area would be terrestrial.

Invertebrates. Impacts to invertebrates from sediment removal would be similar to those described above for bank stabilization activities, although impacts to common aquatic invertebrates would be greater because of the greater area of sediment removal. Because sediment removal would be limited to the stream channel, direct impacts on terrestrial invertebrates would occur primarily because of the operation of equipment in non-instream areas during sediment removal activities (and in staging and access areas).

Vegetation Management

Fish. As discussed under *Bank Stabilization* and *Sediment Removal* above, removal of instream and riparian vegetation may adversely affect steelhead as a result of increased water temperatures, reduced food availability, reduced escape cover, and the alteration of local hydraulics. In addition, decaying vegetation left in the channel following vegetation management activities may cause deterioration of water quality due to the depletion of oxygen.

Settling of silt disturbed by vegetation removal activities may result in adverse effects as discussed under *Bank Stabilization* and *Sediment Removal* above, including potential impacts on salmonid spawning and overwintering habitat and stressing of fish caused by feeding difficulties or displacement.

Proposed vegetation management activities would include the application of herbicides. the U.S. Environmental Protection Agency (USEPA) has conducted ecological risk assessments to determine the potential risks of labeled uses of several herbicides, including three proposed for use by SCVWD (glyphosate, pendimethalin, and triclopyr), on Pacific salmonids. These assessments are useful in evaluating potential effects of herbicide use on fish species in general for the Project Area. Evaluated herbicides proposed for use by SCVWD are as follows, with a summary of USEPA's effects determination:

- Glyphosate: use of the aquatically approved formulation at labeled rates would result in <u>no effect</u> on steelhead.
- Pendamethaline: <u>no effect</u> on steelhead.
- Triclopyr: used as per the label with no exposure to the watercourse, use results in no impact to steelhead. If the material enters the watercourse, it is toxic to fish and results in mortality to steelhead.

Thus, use of these pesticides according to current label directions and the voluntary guidelines provided in the 2000 USEPA bulletin, *Protecting Endangered Species, Interim Measures for Use of Pesticides in Santa Clara County,* is not expected to result in direct adverse effects on fish. Nevertheless, herbicides may affect fish indirectly as a result of reduction in the availability of food items (e.g., invertebrates) and in the suitability of habitat (e.g., reduction in abundance of aquatic and terrestrial plants).

SCVWD would continue to use a surfactant to enhance the performance of herbicides. Surfactants aid the ability of an herbicide to penetrate the surface of vegetation by

increasing its ability to spread over vegetation, stick to foliage, and penetrate thick cuticles. For aquatic herbicides, the use of a surfactant is typically necessary to achieve reasonable levels of control. In instances where surfactants are absent from the tank mix, the level of control is often reduced. A reduction in control results in the need for a greater return frequency, which translates to more herbicide being used in the system and more frequent disturbance to the site.

In general, aquatic species (e.g., fish and amphibians) are more susceptible to adverse effects than terrestrial wildlife because of the potential for surfactants to alter cell permeability, thus increasing the potential for absorption of chemicals through their thin, moist skin. Some surfactants, particularly those that are nonylphenol-based, have been documented to result in chemical-induced lethargy and unconsciousness in fish, which can result in an increased risk of predation, as well as estrogenic effects (Smith et al. 2004, USFS 2007). However, as described in the SMP Manual (Appendix A), SCVWD proposes to limit surfactant use to the products that are documented to have the least toxic effect to aquatic life, Agri-dex and Competitor. Both of these surfactants are oil-based (Competitor is vegetable oil based while the primary ingredient in Agri-dex is a paraffin-based oil) and function by increasing the absorption of herbicides through plant tissues. They are especially useful in increasing the penetration of herbicides through the bark of woody brush or tree stems (Bakke 2007). A study on the toxicity of surfactants to juvenile rainbow trout concluded that Agri-dex was less toxic to rainbow trout than two other commonly used surfactants, R-11 and LI 700 (Smith et al. 2004), and the 2006 Supplemental Environmental Assessment of the National Oceanic and Atmospheric Administration (NOAA) *Fisheries Implementation Plan for the Community Based Restoration Program* (NOAA 2006) concluded that Agri-dex was among the surfactants least toxic to marine and aquatic organisms (it is unknown whether Competitor was assessed).

During the course of the Proposed Project, new surfactants or improved chemistries may be proposed to improve the efficacy of the program or improve protection to biological resources. The proposal of any new materials would include toxicological data for review by stakeholders. This would provide a process for review and approval before inclusion in the program.

Proposed vegetation management activities also may have beneficial impacts on fish. A recent study on the distribution, abundance, growth, and habitat use of steelhead in Uvas Creek (Casagrande 2010) determined that juvenile steelhead survival and growth in Uvas Creek from Uvas Road downstream to Highway 152 is currently limited, in part, because of the high shading and low light levels caused by the dense riparian forest. The author concludes that selective removal of trees within this reach to reduce shading and increase light levels would improve the feeding efficiency of juvenile steelhead and lead to more abundant algal growth. In turn, more abundant algal growth would not only lead to an increase in the invertebrate population (a steelhead food source) but also would filter turbid waters released from upstream reservoirs. Thus, vegetation management activities in at least some portions of the Project Area may benefit steelhead by reducing the density of the riparian canopy.

Amphibians and Reptiles. Similar to the potential direct effects of bank stabilization activities described above, potential impacts of vegetation management activities on

amphibians and reptiles would include mortality of individuals crushed by equipment, vehicle traffic and worker foot traffic; disturbance of boulders or cobbles that supported egg masses; destruction of eggs/nests; silting over of eggs or tadpoles; exposure to petrochemicals, hydraulic fluids, and solvents; disruption of daily or seasonal movements; loss of basking sites; disruption of foraging as a result of vibrations or seismic sounds; and exposure to increased numbers of predators. Furthermore, special-status amphibians and reptiles that were found during pre-construction surveys and relocated to suitable habitat outside of the work site may be subjected to physiological stress and greater risk of predation.

Proposed vegetation management activities would include the application of herbicides. Amphibians in particular could potentially be impacted via absorption of chemicals through their thin, moist skin. USEPA has conducted ecological risk assessments to determine the potential risks of labeled uses of several herbicides, including four proposed for use by SCVWD (glyphosate, imazapyr, pendimethalin, and triclopyr), on the federally listed California red-legged frog. These assessments are useful in evaluating potential effects of herbicide use on other amphibian species in the Project Area. Evaluated herbicides proposed for use by SCVWD are as follows, with a summary of USEPA's effects determination.

- Glyphosate: Likely to affect adversely aquatic-phase California red-legged frog via indirect effects through reduction in prey (non-vascular plants) and habitat (aquatic and terrestrial plants). No direct effects would occur on the aquatic-phase California red-legged frog for any of the terrestrial or aquatic uses. Likely to adversely affect the terrestrial-phase California red-legged frogs via both direct effects and indirect effects following reduction in prey (terrestrial invertebrates, terrestrial-phase amphibians and mammals) and habitat (terrestrial plants).
- Imazapyr: Likely to affect adversely the California red-legged frog via indirect effects on habitat and/or primary productivity (i.e., ecosystem structure and function for both the aquatic plant community and riparian vegetation). No direct effects are anticipated.
- Pendimethalin: Likely to affect adversely the California red-legged frog via both direct and indirect effects on both terrestrial and aquatic phases of the frog.
- Triclopyr: Likely to affect adversely the California red-legged frog via both direct and indirect effects on both terrestrial and aquatic phases of the frog.

As a result, the use of herbicides for vegetation management could adversely affect the health of amphibians; though BMPs would be implemented to reduce these effects, as described below. SCVWD would continue to use herbicides in compliance with the current applicable state and federal laws and in accordance with the PRESCRIBE (Pesticide Regulation's Endangered Species Realtime Internet Bulletin Engine) database that is managed by the California Department of Pesticide Regulation. Herbicides also may affect amphibians indirectly as a result of reduction in the availability of food items (e.g., invertebrates) and in the suitability of habitat (e.g., reduction in abundance of aquatic and terrestrial plants).

As noted for fish above, SCVWD also proposes to use surfactants designed for aquatic applications as part of its herbicide program. Although the potential exists for absorption of chemicals through the thin, moist skin of amphibians, SCVWD purposes to limit surfactant use to the products that are documented to have the least toxic affect to aquatic life, Agri-dex and Competitor.

Birds. Similar to the potential effects of bank stabilization activities described above, potential impacts of vegetation management activities on birds would include mortality or injury of adults or eggs/young in nests crushed by equipment; nest abandonment resulting from increased noise and disturbance; exposure to increased competition because of displacement; exposure to increased numbers of predators; and increased exposure to mercury.

Most importantly, the removal of vegetation would result in a loss of nesting, foraging, and roosting habitat in the form of riparian and wetland vegetation. Riparian habitats in Santa Clara County support very high densities and diversity of birds (Rottenborn 1997). Vegetation management effects would be largely temporary in any specific area, although the repeated nature of these impacts would limit the regeneration of woody riparian vegetation. Bird diversity generally increases with increasing foliage height diversity, or stratification of the vegetation (MacArthur and MacArthur 1961). As a result, inhibiting the development or maintenance of a multi-layered riparian forest through vegetation management is expected to reduce bird diversity. Furthermore, because the densities of native riparian birds tend to increase with increasing vegetation volume (Mills et al. 1991), vegetation management activities that reduced the volume of vegetation (i.e., how dense the vegetation was) could reduce bird abundance. As a result, vegetation management would adversely affect some aspects of the riparian bird community. For species that occurred primarily in early successional habitats, the vegetation management component would help to maintain such habitat over the long term. For species associated with more mature forests, the repeated management of younger vegetation, which would prevent it from becoming mature, may result in the long-term decline in mature riparian forests. Hazard tree removal may result in the loss of snags or other larger trees that otherwise would provide habitat for a variety of birds.

Loss of understory vegetation resulting from pruning, mowing, and limbing up would reduce habitat for understory birds and could reduce dispersal ability of bird species associated with dense vegetation, as such species may be reluctant to move through areas without suitably dense cover. Limbing up would occur primarily along the slopes of levees as mandated by USACE standards, while pruning could occur in a number of areas, particularly along access roads. Hand pruning could occur in up to 40 acres of new work areas during the period 2012–2022. Pruning will occur on woody vegetation in order to restore conveyance capacity of a creek reach, provide visual inspection of District facilities, and to provide access clearance on roadways (not projected in 2002) and for bank stabilization projects. Hand pruning may also be performed for ecological/stewardship purposes.

General work activity would cause most local species to avoid the area until the activity was finished. In the post-construction phase, birds would return to the area as it re-vegetated. Loss of vegetation during maintenance activities could reduce the amount of prey available

for birds that foraged in the work site. However, some birds would take advantage of prey that was flushed out of the area and into the open during construction.

Mammals. Similar to the potential effects of bank stabilization activities described above, potential impacts of vegetation management activities on mammals would include mortality or injury by personnel or equipment; exposure to increased competition from conspecifics as a result of displacement; and exposure to increased levels of predation caused by unfamiliarity with the new area, lack of sufficient refugia, or increased numbers of predators. Removal of riparian and wetland vegetation also would remove habitat and cover for mammals, and loss of understory vegetation resulting from pruning or mowing could reduce dispersal ability of species associated with dense vegetation. As such, species may be reluctant to move through areas without suitably dense cover. For species associated with more mature forests, the repeated management of younger vegetation, which would prevent it from becoming mature, may result in the long-term decline in mature riparian forests. Hazard tree removal may result in the loss of snags or other larger trees that could provide roost sites for bats.

Invertebrates. Similar to the potential effects of bank stabilization activities described above, potential impacts of vegetation management activities on invertebrates would include mortality or injury from crushing by personnel or equipment. In addition, these species could be adversely affected by the loss of host plants as a result of mechanical, physical, or chemical (i.e., herbicide) clearing in the work site; soil compaction; and damage to host plants. Furthermore, these species may be adversely affected by the conversion of habitat, which could occur after the unintentional introduction of non-native grasses and forbs to areas on or near serpentine soils.

Management of Animal Conflicts

Fish. Surface application of erosion control blankets, pyramat, and chain link for the purpose of animal conflicts management may result in a loss of vegetation that was overhanging and shading the active channel. As discussed above, riparian vegetation plays an important role in determining the structure and function of fish habitat, and the loss of such vegetation could result in increased stream temperatures and a loss of escape cover for fish.

Discharge of sediments into the channel as a result of ground-disturbing activities on levee surfaces (e.g., filling or compacting of crevices/holes), or spills/leaks of fuels and other chemicals, may result in adverse effects as discussed under *Bank Stabilization* and *Sediment Removal* above, including potential impacts on salmonid spawning and overwintering habitat and stressing of fish because of feeding difficulties or displacement. The use of certain rodenticides, such as strychnine and zinc phosphide, to control burrowing mammals on levees would be unlikely to result in adverse water quality effects, as these rodenticides would be applied directly in burrows rather than being broadcast over the surface.

Amphibians and Reptiles. Similar to the potential direct effects of bank stabilization and sediment removal activities described above, potential impacts on amphibians and reptiles resulting from the management of animal conflicts would include mortality of individuals crushed by equipment, vehicle traffic, and worker foot traffic; disturbance of boulders or

cobbles that supported egg masses; destruction of eggs/nests; silting over of eggs or tadpoles; exposure to petrochemicals, hydraulic fluids, solvents and lethal baits; disruption of daily or seasonal movements; loss of basking sites; disruption of foraging; and exposure to increased numbers of predators. Furthermore, special-status amphibians and reptiles that were found during pre-construction surveys and relocated to suitable habitat outside of the work site may be subjected to physiological stress and greater risk of predation.

Direct mortality and a loss of subterranean habitat for amphibians and reptiles may occur because of filling or compacting of crevices/holes on levee surfaces or slopes. In addition, control of small mammal populations would result in a reduction in the availability of refugia for amphibians and reptiles. Species that may be adversely affected would include fossorial species and species that sought refuge in small mammal burrows to prevent dehydration during arid conditions or as an escape mechanism for predators. Loss of subterranean habitat may result in the displacement of small mammals and invertebrates that served as a food source for some species of amphibians and reptiles.

In addition to direct loss of subterranean habitat, a reduction in the quantity of subterranean habitat available for amphibians and reptiles would occur from surface application control methods aimed at preventing rodent activity. The use of certain rodenticides (e.g., strychnine and zinc phosphide) to prevent animal conflicts on levees may result in the secondary poisoning of amphibians (e.g., California red-legged frog and California tiger salamander) resulting from dermal exposure (amphibians have thin, permeable skin) to bait placed in burrows or consumption of invertebrates that had consumed the poison bait (USEPA 2009). Furthermore, application of pyramat or other blanket-like surface barriers used to prevent rodent burrowing may result in the entrapment of amphibians and reptiles, leading to death by predation, starvation, or desiccation.

Birds. As discussed above, birds that foraged or roosted in the work site would be impacted while heavy ground disturbance, noise, and vibration caused by the work activity (e.g., filling or compacting of crevices/holes on levee surfaces or slopes) proceeded. Individuals (especially young in nests) could be killed or injured during maintenance activities; the accompanying increase in noise and human presence near active nests could result in the abandonment of nests, and possibly the loss of eggs or young as a result; and the increased activity associated with maintenance activities may affect the behavior of birds, causing them to avoid work sites and possibly exposing them to increased competition and predation.

Increases in human concentration and activity associated with maintenance activities in the vicinity of suitable habitat also may result in an increase in native and non-native predators that were attracted to trash left in the work site and a reduction in the quality of breeding, foraging, or upland refuge habitat from the introduction of non-native vegetation. In addition, surface application of erosion control blankets, pyramat, and chain link for the purpose of animal conflicts management may affect the character of the vegetation on the levee and, thus, the composition of bird species that would use the treated levee slopes.

Filling or compacting of crevices/holes on levee surfaces or slopes may kill or injure burrowing owls (especially young or adults in burrows) crushed by maintenance personnel

or equipment because they nested underground. In addition, the filling of burrows, compaction of soils, or placement of armor material to secure levee surfaces and prevent rodent activity would result in a loss of suitable habitat for the burrowing owl (see Impact Bio-23 for additional detail). Furthermore, small mammal control may reduce the suitability of habitat for birds that foraged in the work site by reducing the availability of prey (e.g., small burrow-dwelling rodents). The use of certain rodenticides (e.g., strychnine, anticoagulants such as chlorophacinone and diphacinone) to prevent animal conflicts on levees may result in the secondary poisoning of birds that consumed rodents or invertebrates that had consumed the poison bait (USEPA 2009).

Mammals. Because burrowing mammals are the primary target of animal conflicts management, obvious direct impacts on target mammals would result from the poisoning and trapping of small mammals, particularly California ground squirrels and valley pocket gophers, and the removal of their burrows. Individuals could be crushed or entombed within their burrows, and some species, particularly ground squirrels, cottontails, and deer mice would have to expend energy to find or dig new underground refuge sites. Carnivorous and omnivorous species would lose some food resources with the loss of underground prey species.

Surface application of erosion control blankets, pyramat, and chain link for the purpose of animal conflicts management may result in direct and indirect impacts on mammal species. Similar to the impacts discussed for birds, the potential impacts on mammals would depend on the material used. Blanket-like materials could trap small mammals and cause mortality. Alternatively, blanket materials could act as cover for species like the California vole, which may be attracted to food resources beneath the barrier but also would be protected from larger predators above the barrier. The chain link barrier would have no impact on small mammals that could access the surface through the open pattern. Medium to large sized mammals, like skunks, ground squirrels, and coyotes would lose refuge sites because burrowing by larger mammals would be prevented by any of the surface barriers.

The use of certain rodenticides (e.g., strychnine and anticoagulants such as chlorophacinone and diphacinone) to prevent animal conflicts on levees may result in the secondary poisoning of larger mammals that consumed rodents or invertebrates that had consumed the poison bait (USEPA 2009). Other impacts would be similar to the potential direct effects of bank stabilization activities described above, including mortality or injury by personnel or equipment; exposure to increased competition from conspecifics as a result of displacement; and exposure to increased levels of predation because of unfamiliarity with the new area, lack of sufficient refugia, or increased numbers of predators.

Invertebrates. Similar to the impacts on invertebrates described above for bank stabilization activities, management of animal conflicts may result in the mortality or injury of invertebrates crushed by personnel or equipment and alteration of habitat. Removal of burrows that provided refugia for invertebrates would reduce habitat for these species. In addition, individuals could be adversely affected because of the loss of host plants. Host plants may be damaged or killed by soil compaction, creation of access roads or staging areas, and surface application of erosion control materials. Furthermore, these species may be adversely affected by the conversion of habitat, which could occur by the unintentional introduction of non-native grasses and forbs to work areas.

Quantification of Impacts

For this evaluation, impacts on both common and special-status animals were assessed based on the potential for individuals or populations of animal species, or their habitat, to be disturbed, degraded, or lost during stream maintenance activities. Impacts on animal populations and communities were evaluated by comparing the quantity and quality of habitat present in the Project Area under baseline conditions to anticipated conditions after implementation of the maintenance activities, and by considering the potential for individual activities to affect populations of these species.

Criteria for Determining Significance

For the purposes of this analysis, the Proposed Project would result in a significant impact on biological resources if it would:

A. have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal;
B. have a substantial adverse effect, either directly or through habitat modification, on an identified candidate, sensitive, listed, or special status species in any local, regional, state, or federal plan, policy, or regulation;
C. have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including but not limited to, marsh, vernal pool, coastal) through direct removal, filling, hydrological interruption, or other means;
D. have a substantial adverse effect on any other sensitive natural community identified in local, region, state, or federal plans, policies, or regulations (such as riparian habitat, oak woodlands, etc.);
E. interfere substantially with the movement of any native resident or migratory species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites; or
F. conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

Environmental Impacts

Tables 3.3-5 and 3.3-6 summarize the acreages of impacts to certain habitats in non-tidal and tidal reaches that would result from sediment removal activities and each type of vegetation management activity that are projected for 2012–2022. These tables include all of these projected activities, including "new" impact areas and areas that have also been impacted by 2002–2012 SMP activities. These acreages include overlap in areas that may be affected by multiple activities; for example, if a specific acre were subjected to herbicide, hand removal, and hand pruning, then those impacts would be represented in the table by an acre of impact in each of those three categories in the table, totaling to 3 acres of impact even though only one acre was involved. As a result, this table over-estimates the actual total acreage of each habitat that would be impacted. Habitat types are based on AIS's 2010 habitat mapping, described previously.

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Table 3.3-5. Projected Impact Acreages by Habitat Type and Activity, Non-tidal Reaches

Watershed	Activity Type	Habitat Type (acres)						
		Woodlands	Herbaceous (non-wetland)	Sediment Wetland	Aquatic (wetland)	Herbaceous (wetland)	Shrub	Misc.
Lower Peninsula	Sediment Removal	3.587	0.51	2.200	0.000	0.625	0.000	4.084
	Herbicide	6.52	3.253	N/A	0.000	0.209	0.262	7.765
	Hand Removal	0.064	0.000	N/A	0.000	0.000	0.000	0.002
	Discing	0.000	0.000	N/A	0.000	0.000	0.000	0.000
	Mowing	0.967	2.659	N/A	0.000	0.008	0.025	0.604
	Hand Pruning	0.139	0.011	N/A	0.000	0.000	0.000	0.084
	Lower Peninsula Subtotal	***11.277***	***6.433***	***2.200***	***0.000***	***0.842***	***0.287***	***12.539***
West Valley	Sediment Removal	2.065	3.227	8.530	0.000	0.798	0.059	1.426
	Herbicide	22.639	31.329	N/A	0.000	2.066	0.321	25.161
	Hand Removal	0.076	0.01	N/A	0.000	0.000	0.005	0.005
	Discing	0.000	0.000	N/A	0.000	0.000	0.000	0.000
	Mowing	1.816	7.644	N/A	0.000	0.314	0.000	0.358
	Hand Pruning	0.225	0.056	N/A	0.000	0	0.001	0.102
	West Valley Subtotal	***26.821***	***42.266***	***8.530***	***0.000***	***3.178***	***0.386***	***27.052***
Guadalupe	Sediment Removal	31.89	5.199	14.640	0.000	1.091	2.405	13.654
	Herbicide	42.051	65.511	N/A	0.000	1.916	1.782	19.619
	Hand Removal	0.237	0.052	N/A	0.000	0.001	0.015	0.004
	Discing	0.071	1.15	N/A	0.000	0.000	0.000	0.000
	Mowing	25.006	20.909	N/A	0.000	1.242	2.914	15.517
	Hand Pruning	0.221	0.046	N/A	0.000	0.001	0.000	0.003
	Guadalupe Subtotal	***99.476***	***92.867***	***14.640***	***0.000***	***4.251***	***7.116***	***48.797***
Coyote	Sediment Removal	45.564	9.472	28.090	0.009	0.786	2.031	4.702
	Herbicide	30.24	137.874	N/A	0.001	34.432	1.299	33.286
	Hand Removal	3.175	0.993	N/A	0.000	0.036	0.069	0.262
	Discing	1.287	5.199	N/A	0.000	0.635	0	0.226
	Mowing	8.151	20.502	N/A	0.000	0.000	0.567	1.776
	Hand Pruning	11.27	3.138	N/A	0.000	0.045	0.188	0.586
	Coyote Subtotal	***99.687***	***177.178***	***28.090***	***0.010***	***35.934***	***4.154***	***40.838***

Table 3.3-5. Projected Impact Acreages by Habitat Type and Activity, Non-tidal Reaches

Watershed	Activity Type	Habitat Type (acres)						
		Woodlands	Herbaceous (non-wetland)	Sediment Wetland	Aquatic (wetland)	Herbaceous (wetland)	Shrub	Misc.
SF Basin Total	Sediment Removal	83.106	18.408	53.460	0.009	3.300	4.495	23.866
	Herbicide	101.450	237.967	N/A	0.001	38.623	3.664	85.831
	Hand Removal	3.552	1.055	N/A	0.000	0.037	0.089	0.273
	Discing	1.358	6.349	N/A	0.000	0.635	0.000	0.226
	Mowing	35.940	51.714	N/A	0.000	1.564	3.506	18.255
	Hand Pruning	11.855	3.251	N/A	0.000	0.046	0.189	0.775
	SF Basin Total	**237.261**	**318.744**	**53.460**	**0.010**	**44.205**	**11.943**	**129.226**
Pajaro Basin Total	Sediment Removal	5.99	10.763	9.810	0.000	0.022	0.038	3.743
	Herbicide	49.097	86.642	N/A	0.268	1.083	0.579	10.719
	Hand Removal	4.173	2.239	N/A	0.047	0.276	0.037	0.442
	Discing	1.731	8.584	N/A	0.000	0.000	0.000	10.596
	Mowing	12.865	36.979	N/A		0.286	0.000	6.494
	Hand Pruning	2.334	4.007	N/A		0.005	0.037	0.111
	Pajaro Basin Total	**76.190**	**149.214**	**9.810**	**0.315**	**1.672**	**0.691**	**32.105**

Notes:

1. Includes areas that also were projected for maintenance (and/or maintenance was conducted) from 2002–2012.
2. Acreages are shown for the total of each type, but overlaps between work types are not eliminated.
3. Acreages incorporate the work area percentage to account for various intensities of work within a specific reach and includes areas that also were projected for maintenance (and/or maintenance was conducted) from 2002–2009.
4. "Misc." habitats include cultivated lands, row crops, vineyards, orchards, developed/urban areas, roads, reservoirs, open water, and similar areas.
5. "Sediment wetland" refers to wetland and aquatic havitats (combined) projected to be impacted by sediment removal, based on calculations performed by SCVWD, taking into account the length of reaches where sediment removal is projected and the approximate widths of the wetland/aquatic habitat within those reaches. SCVWD then identified additional areas (i.e., outside the "sediment wetland" polygons) where the various SMP Update activities were projected in areas mapped by AIS as aquatic habitats (summarized in those tables as "acquatic [wetland]" impacts and vegetation types that are considered herbaceous wetlands (summarized in those tables as "herbaceous [wetland]" impacts).

Source: Data compiled by Horizon Water and Environment in 2011 based on information from SCVWD

Table 3.3-6. Projected Impact Acreages by Habitat Type and Activity, Tidal Reaches.

Watershed	Activity Type	Habitat Type (ac)						
		Woodlands	Herbaceous (non-wetland)	Sediment Wetland	Aquatic (wetland)	Herbaceous (wetland)	Shrub	Misc
Lower Peninsula	Sediment Removal	3.704	0.971	0.370	0.000	0.316	0.069	2.539
	Herbicide	0.000	0.001	N/A	0.000	0.000	0.000	0.001
	Hand Removal	0.139	0.000	N/A	0.000	0.000	0.000	0.000
	Discing	0.000	0.000	N/A	0.000	0.000	0.000	0.000
	Mowing	0.000	0.000	N/A	0.000	0.000	0.000	0.000
	Hand Pruning	0.000	0.000	N/A	0.000	0.000	0.000	0.000
Lower Peninsula Subtotal		***3.843***	***0.972***	***0.370***	***0.000***	***0.316***	***0.069***	***2.540***
West Valley	Sediment Removal	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Herbicide	0.048	0.294	N/A	0.000	0.337	0.000	0.57
	Hand Removal	0.000	0.000	N/A	0.000	0.000	0.000	0.000
	Discing	0.000	0.000	N/A	0.000	0.000	0.000	0.000
	Mowing	0.000	0.000	N/A	0.000	0.000	0.000	0.000
	Hand Pruning	0.000	0.000	N/A	0.000	0.000	0.000	0.000
West Valley Subtotal		***0.048***	***0.294***	***0.000***	***0.000***	***0.337***	***0.000***	***0.570***
Guadalupe	Sediment Removal	2.82	17.302	18.080	0.000	1.611	0.069	1.892
	Herbicide	0.000	0.000	N/A	0.000	0.021	0.000	0.000
	Hand Removal	0.000	0.000	N/A	0.000	0.000	0.000	0.000
	Discing	0.000	0.000	N/A	0.000	0.000	0.000	0.000
	Mowing	0.000	0.000	N/A	0.000	0.000	0.000	0.000
	Hand Pruning	0.000	0.000	N/A	0.000	0.000	0.000	0.000
Guadalupe Subtotal		***2.820***	***17.302***	***18.080***	***0.000***	***1.632***	***0.069***	***1.892***
Coyote	Sediment Removal	0.127	1.231	3.050	0.000	0.541	0.000	2.053
	Herbicide	0.000	0.014	N/A	0.000	0.18	0.000	0.098
	Hand Removal	0.000	0.000	N/A	0.000	0.000	0.000	0.000
	Discing	0.000	0.000	N/A	0.000	0.000	0.000	0.000
	Mowing	0.000	0.000	N/A	0.000	0.000	0.000	0.000
	Hand Pruning	0.000	0.000	N/A	0.000	0.000	0.000	0.000

Table 3.3-6. Projected Impact Acreages by Habitat Type and Activity, Tidal Reaches.

Watershed	Activity Type	Habitat Type (ac)						
		Woodlands	Herbaceous (non-wetland)	Sediment Wetland	Aquatic (wetland)	Herbaceous (wetland)	Shrub	Misc
	Coyote Subtotal	***0.127***	***1.245***	***3.050***	***0.000***	***0.721***	***0.000***	***2.151***
SF Basin	Sediment Removal	6.651	19.504	21.500	0.000	2.468	0.138	6.484
	Herbicide	0.048	0.309	N/A	0.000	0.538	0.000	0.669
	Hand Removal	0.139	0.000	N/A	0.000	0.000	0.000	0.000
	Discing	0.000	0.000	N/A	0.000	0.000	0.000	0.000
	Mowing	0.000	0.000	N/A	0.000	0.000	0.000	0.000
	Hand Pruning	0.000	0.000	N/A	0.000	0.000	0.000	0.000
	SF Basin Total	**6.838**	**19.813**	**21.500**	**0.000**	**3.006**	**0.138**	**7.153**

Notes:

1. Includes areas that also were projected for maintenance (and/or maintenance was conducted) from 2002–2012.
2. Acreages are shown for the total of each type, but overlaps between work types are not eliminated.
3. Acreages incorporate the work area percentage to account for various intensities of work within a specific reach and includes areas that also were projected for maintenance (and/or maintenance was conducted) from 2002–2009.
4. "Misc." habitats include cultivated lands, row crops, vineyards, orchards, developed/urban areas, roads, reservoirs, open water, and similar areas.
5. "Sediment wetland" refers to wetland and aquatic havitats (combined) projected to be impacted by sediment removal, based on calculations performed by SCVWD, taking into account the length of reaches where sediment removal is projected and the approximate widths of the wetland/aquatic habitat within those reaches. SCVWD then identified additional areas (i.e., outside the "sediment wetland" polygons) where the various SMP Update activities were projected in areas mapped by AIS as aquatic habitats (summarized in those tables as "acquatic [wetland]" impacts and vegetation types that are considered herbaceous wetlands (summarized in those tables as "herbaceous [wetland]" impacts).

Source: Data compiled by Horizon Water and Environment in 2011 based on information from SCVWD

Impact BIO-1: Loss or Disturbance of Wetlands and Other Waters (Significance Criteria C and D; Less than Significant with Mitigation)

Maintenance activities associated with the Proposed Project would result in the short-term, but repetitive, disturbance of wetland and aquatic communities, including both jurisdictional and non-jurisdictional wetlands and other waters, which provide valuable habitat for fish and wildlife. As described above under *Determination of Impacts to Aquatic and Wetland Communities*, these activities could result in the placement of fill, hydrological interruption (e.g., dewatering or diversion), alteration of bed and bank, degradation of water quality (e.g., increased sedimentation and turbidity, herbicide contamination), and other direct impacts. The activities would primarily result in the short-term loss and disturbance of wetlands and aquatic habitats; however, small permanent losses could occur because of the use of hardscape for bank stabilization activities.

Over the next 10 years, sediment removal activities may occur in up to 42.8 miles of creeks and canals, including approximately 35.4 miles in the Santa Clara Basin and 7.4 miles in the Pajaro River Basin. Table 3.3-7 includes the total sediment removal work projected for 2012–2022 and identifies how much of this work is estimated for new channel areas ("Projected Sediment Removal, 2012–2022 but not 2002–2012") and how much would occur in channels that were also forecast under the original 2002 program projections ("Projected Sediment Removal, both 2002–2012 and 2012–2022"). The values in Table 3.3-7 indicate the number of miles in which some level of sediment removal would occur. However, because a "work area percentage" would be applied to these sediment removal activities (i.e., only a certain percentage of each reach would undergo sediment removal), the actual extent of creeks subject to sediment removal is expected to be less than what is reported in this table.

Table 3.3-7. Projected Sediment Removal, 2012–2022

Watershed	2012–2022 Total Projected Length (miles)	Projected Sediment Removal, 2012–2022 but not 2002–2012 (miles)	Projected Sediment Removal, both 2002–2012 and 2012–2022 (miles)
Santa Clara Basin			
Lower Peninsula	3.9	0.7	3.2
West Valley	3.8	0.9	2.8
Guadalupe	11	8.7	2.3
Coyote	16.7	5.9	10.8
Pajaro Basin			
Pajaro	7.4	3.1	4.5
Total	**42.8**	**19.3**	**23.5**

Note:

Values have not been adjusted for "work area percentage"; thus, the actual extent of impacts would be lower than reported here.

Source: Data compiled by Horizon Water and Environment in 2011 based on information from SCVWD

Certain types of vegetation management work (hand removal, herbicide, pruning, mowing, and discing) also are projected activities, as shown in Table 3.3-8. This table does not account for overlap in vegetation management activities along the same stream reaches or between different types of vegetation management. For example, if herbicide use were to occur in instream, bank/bench, levee slope, and levee top areas along a specific mile of creek, the herbicide use along that reach would be reflected as 4 miles of impacted creek rather than one mile. In addition, if pruning and mowing were to occur in that one-mile reach, the columns for those activities would reflect that one-mile impact as well. Therefore, Table 3.3-8 does not include a summary of the total stream miles that are projected to be subject to vegetation management activities from 2012–2022. Rather, this table is provided primarily to quantify the number of miles in which the various types of vegetation management are projected to occur during the period 2012–2022.

Table 3.3-8. Projected Vegetation Management 2012–2022

Watershed	Hand Removal (miles)	Herbicide (miles)	Pruning (miles)	Mowing (miles)	Discing (miles)
Santa Clara Basin					
Lower Peninsula	2.5	47.8	22.7	3.8	0
West Valley	3.2	146	61.7	32.6	0
Guadalupe	6.9	277.7	211.6	146.8	0.4
Coyote	88.6	213.4	159.5	58.3	0.5
Pajaro Basin					
Pajaro	49.7	162	156.6	45.9	0.9

Note:
Values do not account for overlapping work areas.
Source: Data compiled by Horizon Water and Environment in 2011 based on information from SCVWD

Wetlands serve a variety of important functions, such as sediment stabilization, sediment/toxicant retention, nutrient removal/transformation, and aquatic and terrestrial wildlife species habitat. These functions may be adversely affected as a result of sediment removal, vegetation management, bank stabilization, and other Proposed Project activities.

The vast majority of wetlands and aquatic habitats providing important ecological functions and values are considered jurisdictional waters of the U.S. by the USACE. However, the canals subject to SMP activities are not expected to be considered waters of the U.S., although this determination ultimately will be made by the USACE. Impacts to unvegetated segments of these canals would not result in substantial adverse effects on wetland or aquatic functions and values, as they would simply result in minor modification (e.g., through sediment removal) of unvegetated areas. However, some pockets of vegetated wetland that are not expected to be considered jurisdictional wetlands are present within the canals. These wetlands do provide important ecological functions and values, serving as habitat for wildlife and, in some areas, supporting the Mt. Hamilton thistle, a special-status plant. Loss of these wetlands would result in a substantial impact even though they are likely non-jurisdictional.

As reported in the 2002 SMP FEIR, SCVWD studies have found that wetland vegetation in some areas often quickly re-establishes following sediment removal activities. The *Instream Wetland Vegetation Regrowth Study* (Rankin and Hillman 2000) found 65 percent and 98 percent average regrowth within 1 and 2 years, respectively, after 1997 sediment removal at six non-tidal freshwater study sites. Average regrowth on two tidal study sites was less, at 21 percent and 29 percent after one and two years, respectively. The pattern of rapid re-establishment, with greater rates in non-tidal than in tidal areas, was supported by regrowth study results on four additional 1998 sediment removal sites. After one year, those sites supported more non-tidal wetland than was present before sediment removal and almost 70 percent of the tidal wetland that was present before sediment removal.

Vegetation dominance and quality (as represented by vegetation type, total percent cover of vegetation, and relative percent cover of native and non-native species) were similar between pre- and post-project years on both sediment removal work sites and reference sites on which sediment removal had not been conducted for several years. At most sites, however, some vegetation shifts did occur. Most shifts were neutral or positive, from the perspective of long-term effects on native communities, including full or partial transition from one native-dominated vegetation type to another, disappearance of a non-native vegetation type, or increased total percent cover. Potentially negative changes occurred less frequently, including slightly increased invasive species cover, appearance or increase in amount of a non-native vegetation type, and decrease in total percent cover.

The *Instream Wetland Vegetation Regrowth Study* (Rankin and Hillman 2000), as well as anecdotal observations by SCVWD biological and vegetation management staff, indicate that wetland extent and species composition are affected by vegetation management. Herbicide spraying likely reduces the amount of the target vegetation present (mostly cattails) in freshwater and tidal wetlands in years following the treatment. By targeting perennial emergent vegetation with herbicides, which kill the entire plant, other wetland vegetation types, such as other herbaceous wetland species and non-native annuals, appear to be favored. In contrast, cattails that are removed by manual methods such as cutting re-sprout each year. Therefore, hand removal does not result in a reduction in abundance of erect emergent vegetation as occurs with herbicide use. On the other hand, herbaceous wetland vegetation benefits from the targeted removal of woody riparian saplings, either by herbicide or hand removal, which would otherwise shade out wetland plants.

The Project Area for the *Instream Wetland Vegetation Regrowth Study* mostly included leveed and excavated channels in lower valley sites where work had been done previously. Therefore, the results of that study are not necessarily applicable to the new work areas, especially higher-elevation areas where sediment removal has not previously been performed. Notably, species composition in these higher-elevation areas is different, and these species are likely much less adapted to disturbance from typical SCVWD maintenance activities. Furthermore, these studies occurred during wet years, and their applicability during drought years is unknown.

SCVWD would implement a number of measures to address the impacts of Proposed Project activities on wetlands and other waters. First, implementation of BMPs would reduce impacts on these habitats by minimizing the spatial extent of maintenance activities, scheduling activities to avoid high-water periods, and designing maintenance

activities to result in the least impact to the stream channel, while still meeting flood conveyance objectives. In addition, SCVWD would implement the relevant project and post-project BMPs during maintenance activities to minimize impacts to water quality (e.g., resulting from erosion and sedimentation; contamination by fuels, herbicides, etc.). These BMPs are listed below; descriptions of each are provided in Table 2-12.

Applicable Best Management Practices

BMP GEN-1: In-Channel Work Windows
BMP GEN-2: Instream Herbicide Application Work Window
BMP GEN-4: Minimize the Area of Disturbance
BMP GEN-16: In-Channel Minor Activities
BMP GEN-20: Erosion and Sediment Control Measures
BMP GEN-21: Staging and Stockpiling of Materials
BMP GEN-23: Stream Access
BMP GEN-26: Spill Prevention and Response
BMP GEN-30: Vehicle and Equipment Maintenance
BMP GEN-32: Vehicle and Equipment Fueling
BMP GEN-35: Pump/Generator Operations and Maintenance
BMP SED-2: Prevent Scour Downstream of Sediment Removal
BMP VEG-1: Minimize Local Erosion Increase from In-Channel Vegetation Removal
BMP VEG-3: Use Appropriate Equipment for Instream Removal
BMP VEG-6: Standard Grazing Procedures
BMP BANK-1: Bank Stabilization Design to Prevent Erosion Downstream
BMP BANK-2: Concrete Use near Waterways
BMP REVEG-1: Seeding

Conclusion

Implementation of these BMPs would minimize disturbance of wetlands and other waters.

The vast majority of impacts to acreage of wetlands and other waters would be short-term, because aquatic habitats would be maintained despite Proposed Project activities (e.g., no loss of aquatic habitat would occur because of any maintenance activity other than, perhaps, bank stabilization). In addition, at least along valley-floor channels, many vegetated wetland areas would restore themselves within 1-2 years following sediment removal or vegetation management, as described previously. Nevertheless, the Proposed Project would result in temporal losses of wetland and aquatic habitat functions and values, possible type conversion of wetlands (e.g., from wetlands dominated by certain plant species to wetlands dominated by others), and potentially permanent losses of wetlands and other waters. Even with BMPs, complete avoidance of fill and water quality degradation could not be accomplished while still meeting the projected goals and public health and safety directives.

Thus, in the absence of any mitigation measures, this impact is considered significant because it would result in short-term degradation and temporary and permanent losses of ecologically valuable wetlands and aquatic habitats, including jurisdictional wetlands and other waters (Significance Criteria C and D), and temporary disruption of stream continuity during sediment removal activities within the channel. Impacts on special-status wildlife species resulting from disturbance or loss of wetland and aquatic habitat

are addressed in separate impact discussions below. Mitigation Measure BIO-1 would be implemented to reduce residual impacts to wetlands and other waters to a less-than-significant level.

Mitigation Measure BIO-1: Implement Compensatory Mitigation for Wetlands and Other Waters

The compensatory mitigation package, which is detailed in Appendix C, 2012–2022 SMP Update Mitigation Approach Memorandum, shall be implemented to compensate for new impacts (i.e., work areas not included in the 2002–2012 work projections) on wetlands (both jurisdictional and non-jurisdictional) and on jurisdictional "other waters"; no mitigation is necessary for impacts to non-jurisdictional "other waters", which are limited to unvegetated areas of inoperable canals. For work areas included in the 2002–2012 work projections, previously provided mitigation would continue to serve as mitigation in perpetuity, as no new significant environmental effects or a substantial increase in the severity of previously identified significant effects are anticipated under the SMP Update.

Following the procedure described in Appendix C, the SCVWD would refine the quantification of impacts to wetlands and other waters that occur during a specific year, tallying the impact totals at the end of the year, and compensatory mitigation will be implemented the following year, in many cases. Exceptions will occur in cases in which compensatory mitigation is incorporated directly into Proposed Project work areas; in those cases, compensatory mitigation may be implemented during the same year in which impacts occur. Details regarding performance criteria for mitigation, as well as for monitoring and reporting, are described in Appendix C.

According to the mitigation package, SCVWD will have several options for satisfying mitigation requirements for impacts to wetlands and other waters by the SMP. The two main types of mitigation that can be applied for impacts to non-tidal wetlands and other waters resulting from sediment removal, vegetation management, canal maintenance, and minor maintenance are "in perpetuity" mitigation and "pay as you go" mitigation.

In perpetuity mitigation. For permanent impacts and, at the discretion of SCVWD, repetitive impacts to wetlands or other waters in a specific area, SCVWD will provide mitigation in perpetuity via one or more of the following methods:

- *In-kind restoration/creation*: SCVWD will restore, preserve, and manage wetlands and aquatic habitats, or substantially improve the quality of highly degraded wetlands and aquatic habitats at a ratio of 1.5:1, meaning 1.5 acres of wetlands or other waters shall be restored/created for every 1 acre of wetlands and other waters impacted by Proposed Project activities.

- *In-kind preservation and enhancement*: SCVWD will acquire, preserve, enhance, and manage lands that provide similar ecologic functions and values to the wetlands and other waters impacted by SMP maintenance activities. The acquisition and preservation/enhancement of these higher quality lands will occur at a ratio of 3:1, meaning 3 acres of wetlands or other waters shall be acquired, preserved, and enhanced for every 1 acre of wetlands and other waters impacted by Proposed Project activities. Enhancement may include modification of existing management, limited

planting, or invasive plant removal, or other activities to enhance wetland/aquatic habitat functions and values.

- *Out-of-kind preservation of watershed lands:* SCVWD will acquire, preserve, enhance, and manage watershed lands. These lands provide more general conservation, open space, and habitat values. Although acquired lands would not be specifically tied or matched in-kind to wetland impacts, as they can include a variety of non-wetland/aquatic habitats, their preservation and management will help to maintain the quality or wetlands and aquatic habitats through management focused on benefits to the aquatic environment, such as management to reduce erosion and sedimentation. The acquisition of more general watershed conservation lands will occur at a ratio of 8:1, meaning 8 acres of land shall be acquired and restored for every 1 acre of impacted habitats resulting from Proposed Project activities.

- *Enhancement or management of land that is owned by other agencies*: SCVWD may collaborate with owners of land that is currently managed for open space or passive recreation. In such cases, SCVWD would not acquire the mitigation lands but would enter into an agreement with the landowners to provide management and financial support toward preserving or improving the lands toward beneficial outcomes, including improved habitats. In these cases, a detailed management plan for species or habitats would be SCVWD's responsibility and would not necessarily be managed by the landowner. The mitigation accounting for such "partnership projects" and how much mitigation would be provided to account for SMP Update activities would be reviewed and developed with regulatory staff on a case-by-case basis.

For any of the three mitigation options above, the mitigation areas will be preserved and managed in perpetuity by SCVWD. Mitigation could occur on lands acquired or owned by SCVWD, or on permanently protected lands not owned by SCVWD but by another entity (e.g., an open space district or park lands). These options would reduce impacts to wetlands and aquatic habitats to less-than significant levels by directly replacing wetlands (in-kind restoration/creation); directly improving the functions and values of existing wetlands and maintaining those resources through long-term management (in-kind preservation and enhancement); or indirectly enhancing and/or protecting wetland and aquatic functions and values by protecting watershed lands that contribute to wetland and aquatic habitat ecology and integrity (out-of-kind preservation of watershed lands). The mitigation ratios for these three options were selected to reflect the relative value of each type of mitigation, with in-kind restoration/creation having the lowest mitigation ratio to reflect its direct compensation for lost wetlands, and out-of-kind preservation of watershed lands having the highest mitigation ratio to reflect its more indirect value in protecting and enhancing wetlands and aquatic habitats. Because acquisition lands will be conserved in perpetuity, the mitigation they provide will also serve the SMP in perpetuity. As a result, if in-perpetuity mitigation were applied to impacts to wetlands and other waters in a certain area, no further mitigation would be needed if repetitive impacts to that area were to occur, in perpetuity.

Pay as you go mitigation. Unless it specifically decides to use in perpetuity mitigation to compensate for impacts to wetlands and aquatic habitats in a certain area (e.g., an area where sediment removal or vegetation management will have frequent, repetitive impacts), SCVWD will use two programs (invasive plant management and riparian

planting) to provide incremental "pay as you go" habitat mitigation to compensate for annual impacts to wetlands and aquatic habitats from sediment removal and vegetation management activities. A mitigation ratio of 1.2:1 (area mitigated to area impacted) shall be applied for habitat impacts from sediment removal and vegetation management activities. SCVWD can use either the invasive plant management program or the riparian planting program (or a combination of the programs) to achieve this net mitigation target for annual activities.

Invasive plant management. The primary goal of the invasive plant management program (IPMP) element of the SMP's compensatory mitigation package is to preserve and improve habitat within Santa Clara County streams and riparian corridors by reducing the population of invasive plant species. The IPMP will have a two-pronged approach:

- a systematic program with the longer-term objective of identifying, prioritizing, and controlling invasive plants throughout the Project Area; and
- an opportunistic, site-specific approach with the objective to remove invasive plants from individual SMP work sites. (As mitigation for vegetation management activities, each of the SMP maintenance sites will be evaluated for on-site invasive plant removal and control. Invasive plant management will focus on controlling species that are invasive at individual SMP work sites.)

Riparian planting. The primary goal of the riparian planting component of the SMP mitigation package is to compensate for the loss of quality and quantity of native-dominated riparian habitat because of maintenance activities. Riparian planting will enhance habitat for birds, amphibians, and other wildlife using terrestrial riparian areas while providing shading, sources of organic matter and coarse woody debris, and water quality benefits to aquatic species.

Opportunities for riparian planting and restoration will be evaluated at all vegetation management maintenance locations. SCVWD's preference will be to first prioritize riparian planting at maintenance sites, and in this way provide direct on-site mitigation for maintenance activities. Riparian planting and restoration will provide mitigation that directly addresses impacts associated with vegetation management activities. Where opportunities for onsite riparian planting and restoration are unavailable or highly constrained, SCVWD will identify offsite locations that can provide suitable mitigation opportunities. Off-site riparian planting restoration sites will be prioritized to:

- stream reaches with riparian restoration opportunities for sensitive fish and/or wildlife species;
- stream reaches where riparian restoration of existing riparian canopy gaps will improve connectivity between existing patches of high-quality riparian habitat; and
- stream reaches with riparian habitat gaps where invasive plant species have been treated to accelerate native riparian plant establishment and inhibit re-colonization by invasive plant species.

Although invasive species management and riparian planting do not result in the direct replacement of lost or degraded wetland habitat, they do contribute substantially to the protection and enhancement of aquatic functions. As a result, riparian buffer plantings have been recognized as an appropriate component of programs to mitigate impacts to jurisdictional wetlands and other waters of the U.S. by the USACE (2002).

The "pay as you go" mitigation areas will not be preserved and managed in perpetuity. However, several factors were considered in determining that these components of the mitigation plan will reduce residual impacts to wetlands and aquatic habitats to less-than-significant levels:

- These "pay as you go" mitigation options will benefit wetlands and aquatic habitats indirectly, by increasing the functions and values of existing wetland and aquatic habitats.
- Any riparian planting area used as pay as you go mitigation for impacts to wetlands or aquatic habitats will remain unimpacted for at least 10 years; or, if the mitigation area is impacted within 10 years, it will then be replaced elsewhere.
- Pay as you go mitigation will be provided each time a specific area of wetlands or other waters is impacted. For example, if the same 1-acre area were impacted three times during the 10-year SMP Update period, then 3.6 acres of pay as you go mitigation will be provided for impacts to that area during the 10-year period.
- Impacts to any specific area will degrade, but will not entirely remove, wetland and aquatic functions and values within the impact area.

Mitigation for Bank Stabilization Impacts. Impacts to non-tidal wetlands and aquatic habitats resulting from bank stabilization will be provided via the methods described in Appendix C and using the mitigation ratios identified in Table 2-4. ~~Softscape repairs will be self-mitigating because they will not result in long-term adverse effects.~~ Mitigation may occur through a combination of replacement of "hard" stabilization measures with soft, biotechnical measures (either on the stabilization site or off-site) or out-of-kind via riparian revegetation as determined by a Mitigation Feasibility Assessment, as described in Appendix C. These measures will reduce impacts to wetlands and aquatic habitats resulting from bank stabilization by increasing the functions and values of existing wetland and aquatic habitats.

Mitigation for Impacts to Tidal Wetlands and Other Waters. SCVWD will continue to implement mitigation measures adopted to reduce impacts for the SMP. Although the 2012 project description has changed, this FSEIR has examined the Proposed Project changes and determined that the existing tidal marsh restoration mitigation measures will continue to reduce the Proposed Project impacts to less than significant. The 2012 SMP Update will be a continuation from the 2002 SMP, with some program modifications; although the work activities are updated, the original mitigation remains, along with the resulting benefits.

As mitigation for impacts to tidal habitats and tidal marsh species predicted to result from the 2002–2012 SMP work activities, SCVWD restored the "Island Ponds" (Ponds A19, A20, and A21), located between Coyote Slough and Mud Slough near Alviso, to tidal action. Restoring these ponds provided 30 acres of tidal habitat that is used by a variety of tidal marsh species. Monitoring has documented achievement of all performance criteria appropriate for the development of both vegetated tidal salt/brackish marsh and tidal aquatic habitat, ~~including~~with the formation of nascent tidal marsh habitat, including extensive channel networks, within these ponds.

The 2002 SMP work projections provided the basis for determining the SMP's initial, upfront compensatory mitigation. As a result of those projections, impacts to tidal habitats for the 2002-2012 SMP Update were calculated with a mitigation requirement of 30 acres of tidal restoration. SCVWD already has met this obligation by restoring 30 acres of tidal habitat with the "Island Ponds." ~~Thirty acres of tidal restoration within the Island Ponds was intended to serve as mitigation for impacts to tidal habitats for the 2002–2012 SMP.~~ However, not all of the 2002 projected work has actually been performed. Thus, the 2002 mitigation of 30 acres of restored tidal habitat paid for more work than was conducted. Based on the actual impacts from activities conducted between 2002–2012~~ Proposed Project activities~~, only 9 acres of tidal mitigation ~~will be~~is needed to compensate for those impacts.

The 2002–2012 SMP created an upfront compensatory mitigation package to account for SMP impacts in perpetuity. The 2012–2022 SMP Update has modified the project description to refine maintenance work activity needs. The updated project description in this FSEIR is a continuation, with modifications, of the 2002–2012 SMP.

SCVWD will remove the 2002 work activity projections that would have resulted in the need for 21 tidal habitat mitigation acres. The removal of these projections, therefore, will equate to having 21 acres of tidal habitat mitigation that is not attributed to ongoing SMP impacts. ~~Therefore, SCVWD created 21 acres of excess tidal habitats.~~ SCVWD will use the 21 acres of ~~excess~~ tidal ~~marsh~~habitat restoration as available mitigation for impacts to tidal wetlands and aquatic habitats, as well as tidal marsh species, that may occur under the 2012–2022 SMP Update. ~~Physical breaching of the Island Pond levees and other physical work required for this tidal restoration has already occurred, and no further activities (other than continued monitoring of marsh development per the 2002–2012 SMP monitoring requirements) are proposed by SCVWD.~~

It is possible that these mitigation measures may be refined during permitting with the USACE, RWQCB, and CDFG, in which case the refinements required by these resource agencies would be implemented.

MM BIO-1 will mitigate impacts to wetlands and other waters, including jurisdictional waters of the U.S./state, to less-than-significant levels by replacing lost wetlands and aquatic habitats through restoration or by replacing the lost functions and values provided by these habitats through other means, such as non-native plant removal and watershed protection. Thus, MM BIO-1 will assure that the SMP does not result in a substantial adverse effect on federally protected wetlands or on sensitive wetland and aquatic communities.

Impact BIO-2: Loss or Disturbance of Woody Riparian Vegetation (Significance Criterion D; Less than Significant with Mitigation)

Bank stabilization, sediment removal, and vegetation management activities would result in the loss and disturbance of woody riparian vegetation that occurred along the stream banks above the ordinary high water mark. As described above under *Determination of Impacts to Non-Instream Sensitive Plant Communities*, these activities could result in the loss of vegetation through directly removal, herbicide use, trampling, and other impacts.

Although the effects of bank stabilization on riparian vegetation are difficult to quantify precisely, based on past work records, SCVWD stabilizes nearly one mile of stream bank per year (approximately 0.75 miles in the Santa Clara Basin and 0.25 miles in the Pajaro Basin). Impacts to riparian vegetation could occur during sediment removal activities as well (e.g., during access to sediment removal areas and movement of equipment for sediment removal), although predicting the impacts to riparian habitat quantitatively would not be possible beyond the linear miles of creek subject to sediment removal (summarized in Table 3.3-7) because sediment removal would target instream sediment.

Impacts of projected vegetation management activities on woody riparian vegetation were summarized by SCVWD using AIS's vegetation mapping (to determine where instream woodland, forest, and scrub-shrub vegetation was located) and the 2012–2022 projections. Table 3.3-9 summarizes these estimated impacts by watershed for riparian woodland/forest and scrub-shrub habitats. Because of overlap between certain types of vegetation removal activities (i.e., with multiple activities occurring in the same general area), the total number of acres that would be subject to impact by projected vegetation management activities would be lower than the totals in this table.

Table 3.3-9. Estimated Impacts to Riparian Woodland, Forest, and Scrub-Shrub from Projected Vegetation Management, 2012–2022

Watershed	Hand Removal (acres)	Herbicide (acres)	Pruning (acres)	Mowing (acres)	Discing (acres)	Total (acres)
Lower Peninsula	0.2	3.7	0.1	0.8	0	4.8
West Valley	0.1	18.5	0.2	1.8	0	20.6
Guadalupe	0.2	31.4	0.2	27.9	0.1	59.8
Coyote	3.3	26.5	11.4	8.7	1.3	51.2
Pajaro	4.2	40.7	1.5	9.3	1.7	57.4
Total	**8.0**	**120.8**	**13.4**	**48.5**	**3.1**	**193.8**

Note:
Some of the activities in this table overlap within a specific area. Also, SCVWD may perform additional pruning that could affect up to 40 acres during the period 2012–2022.

Source: Data compiled by Horizon Water and Environment in 2011 based on information from SCVWD

~~Hand pruning has been projected in 40 acres of new work areas. Pruning will occur on woody vegetation in order to restore conveyance capacity of a creek reach, provide visual inspection of District facilities, and to provide access clearance on roadways (not projected in 2002) and for bank stabilization projects. Hand pruning may also be performed for ecological/stewardship purposes.~~ The pruning projections in Table 3.3-9, totaling 13.4 acres, were derived from SCVWD's database of reach-by-reach projected activities. In addition, additional pruning are expected to be necessary in areas that are not yet completely defined, to restore conveyance capacity of a creek reach, provide visual inspection of SCVWD facilities, and provide access clearance on roadways, for bank stabilization projects and for ecological/stewardship purposes. As a result, SCVWD has allowed for the possibility that pruning may affect considerably more acreage than has been indicated in Table 3.3-9 and has set a cap of 40 acres of pruning for the entire 10-year 2012–2022 program.

In addition, unprojected activities (e.g., management of animal conflicts and minor maintenance) could potentially result in the loss or disturbance of woody riparian vegetation.

Vegetation that is removed by Proposed Project activities is expected to regrow, except in areas where bank stabilization would result in the permanent loss of natural streambank, or where capacity or other maintenance activities would require the permanent exclusion of vegetation. Thus, most Proposed Project impacts to riparian habitats would be temporary in that they would not preclude the potential for woody riparian vegetation to regrow. However, repetitive impacts to woody riparian vegetation would prevent regrowth, at least during the 10-year duration of the SMP Update. Proposed Project activities also may contribute towards the long-term modification of riparian plant communities if certain plant species were targeted. For example, young cottonwoods often are removed by vegetation management activities, which prevents these trees from maturing into the large trees that provide habitat for a number of wildlife species. Cottonwoods already suffer the effects of stream modification, including restrictions on the ability of streams in urban areas to meander, and thus regeneration of cottonwood-

dominated forests in urban Santa Clara County is poor. Proposed Project activities that would prevent the maturation of cottonwoods could contribute to the long-term decline in multi-aged cottonwood-dominated riparian forests in the county.

Riparian communities are considered sensitive habitats in and of themselves. In addition, riparian habitats include two plant communities, sycamore alluvial woodland and oak woodlands, that also are considered sensitive. Impacts to sycamore alluvial woodland and oak woodlands are addressed in greater detail under Impact BIO-3.

As discussed above, woody riparian habitats in the Project Area provide a wide range of biological functions for fish and wildlife, ranging from providing habitat for fish and other aquatic species to foraging and nesting habitat for birds, to movement corridors for numerous terrestrial species. As a result, impacts to riparian habitats would affect a variety of fish and wildlife species as well. Impacts on special-status plant and wildlife species resulting from disturbance or loss of riparian habitat are addressed in separate impact descriptions below.

Riparian vegetation in some work sites would include herbaceous vegetation rather than woody vegetation. Herbaceous vegetation, which often includes species such as black mustard (*Brassica nigra*), poison hemlock (*Conium maculatum*), perennial ryegrass (*Lolium perenne*), Italian thistle, bristly ox-tongue, sweet fennel (*Foeniculum vulgare*), and smilograss (*Piptatherum miliaceum*), typically dominates the banks of reaches that would be frequently disturbed (including disturbance from ongoing maintenance activities). Such vegetation regenerates quickly and, compared to woody riparian vegetation dominated by trees and shrubs, would provide relatively low functions and values for wildlife. As a result, impacts of Proposed Project activities on non-wetland, herbaceous riparian vegetation would not have substantial ecological effects.

SCVWD would implement a number of measures to address the impact of Proposed Project activities on woody riparian vegetation, including limiting impacts to the minimum area required and conducting pruning according to the National ANSI A300 standards. These BMPs are listed below, and descriptions of each are provided in Table 2-12.

Applicable Best Management Practices

BMP GEN-4: Minimize the Area of Disturbance
BMP GEN-21: Staging and Stockpiling of Materials
BMP GEN-23: Stream Access
BMP GEN-28: Fire Prevention
BMP REVEG-1: Seeding
BMP REVEG-2: Planting Material

Conclusion

Implementation of these BMPs would minimize disturbance of woody riparian vegetation. Nevertheless, the Proposed Project would result in temporal losses of woody riparian functions and values and some permanent losses of woody riparian habitat because complete avoidance could not be accomplished while still meeting the project goals for public health and safety directives. Thus, significant residual impacts would remain. The impact of Proposed Project activities on woody riparian vegetation is considered

significant because it would result in short-term degradation of riparian habitat (Significance Criterion D) and temporary and permanent loss of riparian vegetation (Significance Criterion D). Mitigation Measure BIO-2 would be implemented to reduce this residual impact to a less-than-significant level.

As discussed above, riparian vegetation in some work sites would include herbaceous vegetation rather than woody vegetation. Compared to woody riparian vegetation dominated by trees and shrubs, such vegetation regenerates quickly and generally provides relatively low functions and values for wildlife. As a result, impacts of Proposed Project activities on non-wetland, herbaceous riparian vegetation are less-than-significant, and no mitigation for such impacts is required (although impacts to herbaceous wetland vegetation, which may extend up into riparian areas from the creek channel, would be significant as discussed under Impact BIO-1).

Mitigation Measure BIO-2: Implement Compensatory Mitigation for Woody Riparian Vegetation

The compensatory mitigation package, which is incorporated into the Proposed Project and detailed in Appendix C, shall be implemented to compensate for new impacts (i.e., work areas not included in the 2002–2012 work projections) on woody riparian vegetation. For work areas included in the 2002–2012 work projections, previously provided mitigation would continue to serve as mitigation in perpetuity, as no new significant environmental effects or a substantial increase in the severity of previously identified significant effects are anticipated under the updated program.

Following the procedure described in Appendix C, the SCVWD would refine the quantification of impacts to riparian vegetation that occur during a specific year, tallying the impact totals at the end of the year, and compensatory mitigation will be implemented the following year, in many cases. Exceptions will occur in cases in which compensatory mitigation is incorporated directly into the SMP work areas; in those cases, compensatory mitigation may be implemented during the same year in which impacts occur. Details regarding performance criteria for mitigation, as well as for monitoring and reporting, are described in Appendices C and Appendix L.

According to the mitigation package, SCVWD will have several options for satisfying mitigation requirements for impacts to riparian vegetation by the SMP. The two main types of mitigation that can be applied for impacts to riparian vegetation resulting from sediment removal, vegetation management, canal maintenance, and minor maintenance are “in perpetuity” mitigation and “pay as you go” mitigation. These mitigation options would be applied to riparian vegetation as described in Mitigation Measure BIO-1 for wetlands and other waters.

For any of the three “in perpetuity” mitigation options, the mitigation areas will be preserved and managed in perpetuity by SCVWD or a land management agency. These options will reduce impacts to riparian vegetation to less-than significant levels by directly replacing such vegetation (in-kind restoration/creation); directly improving the functions and values of existing riparian vegetation and maintaining those resources through long-term management (in-kind preservation and enhancement); or indirectly enhancing and/or protecting riparian functions and values by protecting watershed lands that

contribute to riparian habitat ecology and integrity (out-of-kind preservation of watershed lands). The mitigation ratios for these three options were selected to reflect the relative value of each type of mitigation, with in-kind restoration/creation having the lowest mitigation ratio to reflect its direct compensation for lost riparian vegetation, and out-of-kind preservation of watershed lands having the highest mitigation ratio to reflect its more indirect value in protecting and enhancing riparian vegetation. Because acquisition lands will be conserved in perpetuity, the mitigation they provide also will serve the SMP in perpetuity. As a result, if in-perpetuity mitigation is applied to impacts to riparian vegetation in a certain area, no further mitigation will be needed if repetitive impacts to that area occurs, in perpetuity.

"Pay as you go" mitigation via invasive plant management and riparian planting will directly compensate for impacts to riparian vegetation. In many areas, invasive plant management will remove invasive species that occupy areas that otherwise can support riparian vegetation, and that threaten further to invade riparian areas. Riparian planting obviously will provide in-kind mitigation for impacts to riparian vegetation.

Mitigation for bank stabilization impacts also will be provided, as described in Mitigation Measure BIO-1 for wetlands and other waters.

Two components of the mitigation package that are directly applicable to the compensation for impacts to riparian vegetation, but that were not applicable to (and thus not discussed in) Mitigation Measure BIO-1, are mitigation for pruning and mitigation for removal of trees 6-12 inches dbh (removal of trees greater than 12 inches dbh is not included in the SMP).

The mitigation requirement for pruning is the same as the riparian replanting mitigation ratio of 1.2:1. Based on the International Society of Arboriculture pruning standards, and the SMP Manual (Appendix A), no more than 25 percent of a tree would be pruned, unless greater pruning is necessary for safety or specific ecological purposes (e.g., codominant stem species). Applying the degree of impact (25 percent of any given tree) to the mitigation ratio of 1.2:1, the resulting mitigation factor is 0.3. Up to 40 acres of pruning may occur, and thus the resulting mitigation acreage necessary is 12 acres (40 acres x 0.3). Whereas other mitigation will be calculated on an annual basis, these 12 acres of mitigation will be provided for the entire program, and a maximum (or "cap") of 40 acres of hand pruning will be established for the entire program for the period 2012–2022.

Removal of trees up to 6 inches dbh will not require mitigation on a tree-by-tree basis; rather, impacts to woody riparian vegetation comprised of trees or shrubs less than 6 inches dbh will be mitigated (as described above) via in perpetuity or pay as you go mitigation. However, removal of trees sized 6-12 inches dbh will be mitigated through the individual planting of replacement trees. Appendix B in the 2012–2022 SMP Update Mitigation Approach Memorandum (Appendix C), *Tree Scoring for Removal of Trees and Shrubs ≤ 12"DBH* provides a specific tree appraisal and evaluation protocol to determine how replacement planting occurs. The protocol involves carefully assessing targeted tree removals for their existing conditions and functions, including their canopy cover, local area value, ecosystem benefits, and ecosystem detriments. Using a cumulative ranking method, tree replacement mitigation ratios for removed trees (6-12 inches dbh) occurs at

either 1:1, 2:1, or 3:1 (replacement tree to removed tree), depending on the overall quality and function of the removed tree.

Impacts to riparian vegetation containing trees 6-12 inches dbh are, therefore, mitigated in two ways—mitigation on an acreage basis via in perpetuity or pay as you go mitigation, plus mitigation via replacement of trees 6-12 inches dbh. The two mitigation areas will be non-overlapping. As a result, the extent of mitigation for impacts to more mature woody riparian vegetation will be greater, as is appropriate based on the greater functions and values to wildlife, than impacts to less mature riparian vegetation.

As part of the riparian mitigation component, SCVWD will mitigate impacts to sensitive riparian communities, including sycamore alluvial woodland and oak woodland, in-kind. For a specific extent of impact to sycamore alluvial woodland or oak woodland, the in perpetuity or pay as you go mitigation that is applied to that impact will focus on enhancement, preservation, and/or restoration of that sensitive community type; removal of invasives will not be considered appropriate mitigation for these sensitive community types unless accompanied by restoration that targets that community type. Similarly, when impacts to high-quality occurrences of cottonwood-dominated forest occur, SCVWD will mitigate by providing cottonwood-dominated mitigation sites. "High-quality" occurrences will be determined by a qualified botanist based on criteria such as evidence of natural regeneration and the presence of multi-layered and multi-aged stands.

It is possible that these mitigation measures may be refined during permitting with the USACE, RWQCB, and CDFG, in which case the refinements required by these resource agencies would be implemented.

MM BIO-2 will mitigate impacts to riparian habitats to less-than-significant levels by replacing lost riparian vegetation through restoration or by replacing the lost functions and values provided by these habitats through other means, such as non-native plant removal and watershed protection. Thus, MM BIO-2 will assure that the SMP does not result in a substantial adverse effect on sensitive riparian communities.

Impact BIO-3: Disturbance of Sensitive Plant Communities (Significance Criteria A and D; Less than Significant with Mitigation)

Sensitive plant communities (see *Regulated and Sensitive Natural Communities* above) often are of limited distribution within a region and frequently support special-status species or high numbers of common species. Thus, the conservation of these natural communities is integral to maintaining biological diversity. However, as described above under *Determination of Impacts on Aquatic and Wetland Communities* and *Determination of Impacts on Non-instream Sensitive Plant Communities*, Proposed Project activities may affect sensitive plant communities through direct disturbance of vegetation and disturbance, modification, or destruction of habitat. Impacts to wetlands and aquatic habitats in general, which are considered sensitive communities, are described under Impact BIO-1, and impacts to riparian habitats (also sensitive communities) are described under Impact BIO-2. Impact BIO-3 focuses on specific sensitive communities, such as northern coastal salt marsh, sycamore alluvial woodland, and serpentine communities. Table 3.3-10 summarizes estimated impacts of projected SMP Update activities on these

latter communities, based on mapping by AIS and SCVWD projections for maintenance activities during the period 2012–2022.

Table 3.3-10. Estimated Impacts to Northern Coastal Salt Marsh, Sycamore Alluvial Woodland, and Serpentine Communities from Projected SMP Update Activities, 2012–2022

Community	Projected Impact (acres)
Northern Coastal Salt Marsh	8.3
Sycamore Alluvial Woodland	17.6
Coast Live Oak	27.3
Valley Oak	7.2
Serpentine	24.4

Note:
Source: Data compiled by Horizon Water and Environment in 2011 based on information from SCVWD and AIS.

Northern coastal salt marsh would not be directly impacted by sediment removal, but vegetation management in 8.3 acres of salt and brackish marsh habitats would affect these habitats. Some vegetation management would result in temporary degradation of northern coastal salt marsh communities via mowing or removal of plants, which would affect the structure of this community and the services it would provide to wildlife. Impacts to this community would be as described under Impact BIO-1 for wetland and aquatic habitats. However, the majority of such impacts (6.8 acres) would occur as a result of herbicide application in perennial pepperweed-dominated areas near Coyote Slough and Coyote Bypass. This activity, which occurs in part as mitigation for impacts resulting from the Lower Coyote Creek capital project, would enhance habitat conditions by reducing the infestation of salt marsh by the invasive perennial pepperweed.

No activities are projected within the highest-quality occurrences of sycamore alluvial woodland, such as those along Coyote Creek from U.S. Highway 101 downstream to the Ogier Ponds, or along Pacheco Creek. However, vegetation management activities are projected in 17.6 acres mapped as sycamore-dominated by AIS. More than half of this impact would occur in the Guadalupe River watershed. Impacts to this community would occur in the same ways as described under Impact BIO-2 for impacts to woody riparian vegetation.

Impacts to oak woodland communities would occur in a number of locations where the streamside vegetation is dominated by oaks. Approximately 23.4 acres dominated by coast live oak and 3.1 acres dominated by valley oak would be impacted by projected vegetation management activities in the Santa Clara Basin, while 3.9 acres dominated by coast live oak and 4.1 acres dominated by valley oak would be impacted by projected vegetation management activities in the Pajaro Basin. Impacts to this community would occur in the same ways as described under Impact BIO-2 for impacts to woody riparian vegetation.

Projected activities would occur in or very close to serpentine communities, primarily along portions of the Coyote Canal, Coyote Canal Extension, Coyote Alamitos Canal, and

Almaden Calero Canal, where high-quality serpentine communities were mapped by SCVWD botanist J. Hillman based on surveys in 2004 and 2008 (Figure 3.3-2). Although serpentine communities likely would occur near work sites elsewhere, such as along Upper Silver Creek, no high-quality serpentine communities were identified in these areas during SCVWD's surveys. As described under *Determination of Impacts to Non-instream Sensitive Plant Communities* above, proposed maintenance activities could result in a variety of impacts on serpentine communities. For example, during any bank stabilization, sediment removal, vegetation management, and animal conflict management activity that would occur in or adjacent to serpentine, equipment use, vehicle traffic, and worker foot traffic may result in the injury or mortality of individual plants. These activities could result in death, altered growth, or reduced seed set through physically breaking, crushing, wilting, or uprooting plants, and the compaction of soil by heavy equipment could damage plant roots. In addition, vegetation management activities and the creation of access routes and staging areas may result in the mechanical or physical removal of vegetation as a result of off-target herbicide contact via drift. Although such impacts would be temporary in that they would not preclude the regeneration of serpentine vegetation, the repetitive nature of impacts in at least some areas would result in longer-term effects over the 10-year duration of the SMP Update. Permanent impacts to serpentine communities may occur if bank stabilization activities were necessary in such areas. Unprojected activities (e.g., bank stabilization, management of animal conflicts, and minor maintenance) also could result in the loss or disturbance of serpentine communities.

For the sake of estimating the extent of potential impacts to serpentine plant communities, all projected activities along canals that were determined to provide high-quality serpentine communities, as depicted in Figure 3.3-2, were evaluated. These activities are projected to impact up to 5.04 linear miles of Coyote, Coyote Extension, Coyote Alamitos, and Almaden Calero Canals within high-quality serpentine communities. Assuming (conservatively) that areas up to 20 feet on either side of the canal could be impacted, projected activities could impact up to 24.43 acres of high-quality serpentine communities.

SCVWD would implement several measures to address the impacts of Proposed Project activities on sensitive plant communities, including pre-project planning BMPs to minimize the area of disturbance and pre-activity surveys to identify and avoid sensitive plant communities. These BMPs are listed below, and descriptions of each are provided in Table 2-12.

Applicable Best Management Practices

BMP GEN-4: Minimize the Area of Disturbance
BMP GEN-9: Avoid Impacts to Special-Status Plant Species and Sensitive Natural Vegetation Communities
BMP GEN-21: Staging and Stockpiling of Materials

Conclusion

Implementation of these BMPs would minimize disturbance of sensitive plant communities. Nevertheless, the Proposed Project would result in temporal losses of functions and values, and possibly some permanent losses of sensitive plant communities because complete avoidance could not be accomplished while still meeting the project goals for public health and safety directives. Thus, residual impacts would remain. Although most of the impacts to northern coastal salt marsh would result from beneficial activities (invasive species management), and impacts to sycamore-dominated habitat would not strictly be to typical sycamore alluvial woodland communities, both impacts would be significant because of the value of these communities to wildlife (Significance Criteria A and D). Impacts to serpentine communities, because of the importance of these communities to special-status species and their regional rarity, and to oak woodlands, because of their ecological importance to a diversity of riparian and upland wildlife species, would be significant (Significance Criteria A and D).

No mitigation would be required for vegetation management that was specifically performed for ecologically beneficial purposes; for example, management of the invasive perennial pepperweed in the Coyote Creek Bypass area would benefit the northern coastal salt marsh community, and thus it would not require mitigation. As noted under Mitigation Measure BIO-1, ~~excess~~ mitigation provided by restoration of tidal habitats at the Island Ponds under the 2002–2012 SMP also would compensate for impacts of 2012–2022 Proposed Project activities on tidal wetlands, such as northern coastal salt marsh. Therefore, implementation of Mitigation Measure BIO-1 would reduce Proposed Project impacts to northern coastal salt marsh communities to less-than-significant levels.

Implementation of Mitigation Measure BIO-2 would reduce residual impacts to sycamore alluvial woodland/oak woodland and serpentine communities, respectively, to a less-than-significant level by implementing applicable components of the mitigation package with a direct focus on mitigation specific to these two community types whenever impacts to these communities occurred.

Mitigation Measure BIO-3 would be implemented to reduce impacts to sensitive plant communities to a less-than-significant level.

Mitigation Measure BIO-3: Implement Compensatory Mitigation for Serpentine Communities

SCVWD will provide mitigation for unavoidable impacts to high-quality serpentine communities, including grassland, rock outcrops, seeps, and chaparral. SCVWD would refine the quantification of impacts to high-quality serpentine habitat on an annual basis. Along SCVWD's canals, where most or all SMP impacts to serpentine species and communities are expected to occur, high-quality serpentine communities were mapped by SCVWD using data gathered during surveys in 2004 and 2008. Serpentine communities are considered to be of "high quality" if they are in a semi-natural or natural/undisturbed state and meet one or both of the following criteria:

- Presence of multiple special-status plant occurrences
- Relatively high abundance of natives or serpentine obligates vs. non-natives

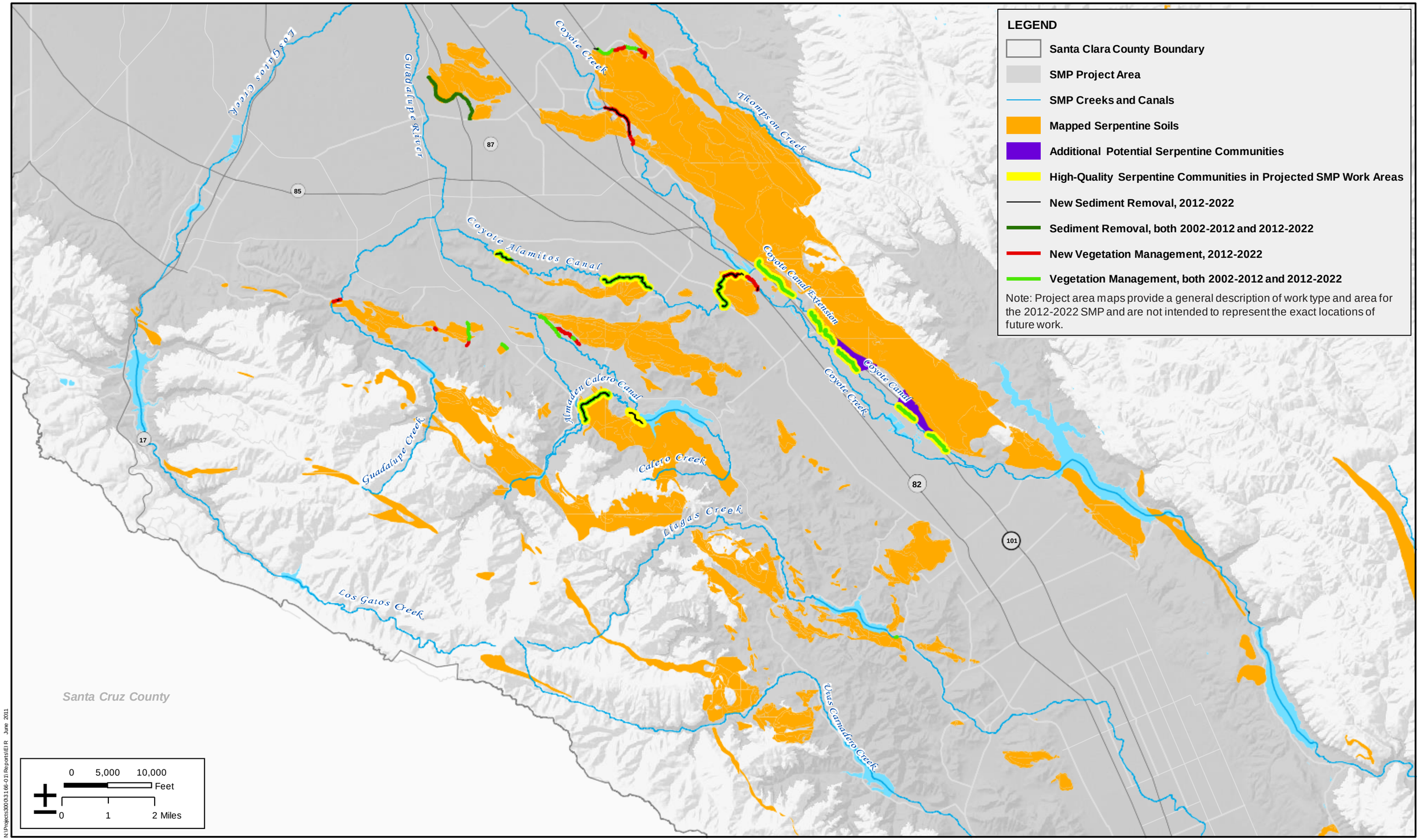

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Figure 3.3-2: Projected SMP Update Activities in Serpentine Communities

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Before Proposed Project activities that can impact serpentine communities and species, an SCVWD botanist will conduct a review of potential serpentine impact areas using existing data, such as SCVWD's mapping, and field verification as needed, to identify high-quality serpentine communities. At the end of that year's maintenance period, SCVWD will determine the extent of impacts to high-quality serpentine communities that have occurred during the year.

Compensation for unavoidable effects to high-quality serpentine communities will be provided via the protection, enhancement, and management of serpentine communities outside SMP work sites at a 2:1 (mitigation:impact~~:mitigation~~) ratio, on an acreage basis. SCVWD will acquire land supporting serpentine communities via fee title or purchase of a conservation easement. Compensatory mitigation may be carried out through one or both of the following methods, in order of preference:

- The preservation and management of existing serpentine communities
- The restoration or enhancement of previously existing or degraded serpentine communities

SCVWD will develop a Habitat Mitigation and Management Plan (HMMP), describing the measures that will be taken to enhance and manage the mitigation lands and to monitor the effects of management on serpentine communities. That plan will include, at a minimum, the following:

- A summary of impacts to high-quality serpentine communities and the proposed mitigation
- A description of the location and boundaries of the mitigation site and description of existing site conditions
- A description of measures to be undertaken if necessary to enhance (e.g., through focused management) the mitigation site for serpentine communities
- Proposed management activities, such as managed grazing and management of invasive plants, to maintain high-quality serpentine communities
- A description of community monitoring measures on the mitigation site, including specific, objective goals and objectives (including maintaining or increasing native plant species diversity), performance indicators and success criteria (including maintaining or increasing the relative abundance of native vs. non-native species), monitoring methods (including vegetation sampling for plant species composition), data analysis, reporting requirements, and monitoring schedule

  (Determining other specific performance/success criteria requires information regarding the specific mitigation site, its conditions, the biological resources present on the site, and the specific enhancement and management measures tailored to that site and its conditions. As a result, additional~~those~~ specific criteria will be defined in the HMMP rather than in this SEIR. Nevertheless, the performance/success criteria described in the HMMP will guide the mitigation for management and protection of high-

quality serpentine communities to adequately compensate for the functions and values of the impacted communities.)

- A description of the management plan's adaptive component, including potential contingency measures for mitigation elements that do not meet performance criteria
- A description of the funding mechanism for the long-term maintenance and monitoring of the mitigation lands

After mitigation has been provided for impacts to a specific area supporting high-quality serpentine communities and/or special-status species from a specific year's activities, future (i.e., repetitive) impacts to that area will not require additional mitigation.

The HMMP will be provided to the USFWS for review because some of the serpentine-associated special-status species that would benefit from this mitigation are federally listed species regulated by the USFWS. It is possible that this mitigation measure may be refined during the Section 7 consultation process with the USFWS (e.g., in the Biological Opinion covering Project effects on federally listed, serpentine-associated species), in which case the refinements required by the USFWS would be implemented.

MM BIO-3 will mitigate impacts to sensitive serpentine communities to less-than-significant levels by replacing the functions and values provided by such communities through the enhancement, management, and protection of serpentine communities. Thus, MM BIO-3 will assure that the SMP does not result in a substantial adverse effect on sensitive serpentine communities or threaten to eliminate this plant community.

Impact BIO-4: Impacts to Serpentine-Associated Special-Status Plant Species (Significance Criteria A and B; Less than Significant with Mitigation)

Serpentine plant communities in the Project Area support a unique assemblage of plant species, including the following special-status species (see Figure 3.3-3 and Table 3.3-~~20~~21):

- Tiburon paintbrush
- Coyote ceanothus
- Santa Clara Valley dudleya
- Metcalf Canyon jewel-flower
- Big-scale balsamroot
- Pink creamsacs
- Mt. Hamilton thistle
- Fragrant fritillary (*Fritillaria falcata*)
- Woolly-headed lessingia (*Lessingia hololeuca*)
- Smooth lessingia (*Lessingia micradenia* var. *glabrata*)
- Most beautiful jewel-flower (*Streptanthus albidus* ssp. *peramoenus*)

Neither the Tiburon paintbrush nor Coyote ceanothus are known to occur in or very close to areas where activities are either projected or expected to occur, and because of the intensity of survey effort for these species over the years, both on SCVWD facilities and in general, a previously unknown occurrence is not expected to be located in an area where it could be affected by Proposed Project activities. However, the possibility of colonization of serpentine habitat in or near the Coyote, Coyote Extension, Coyote Alamitos, or Almaden

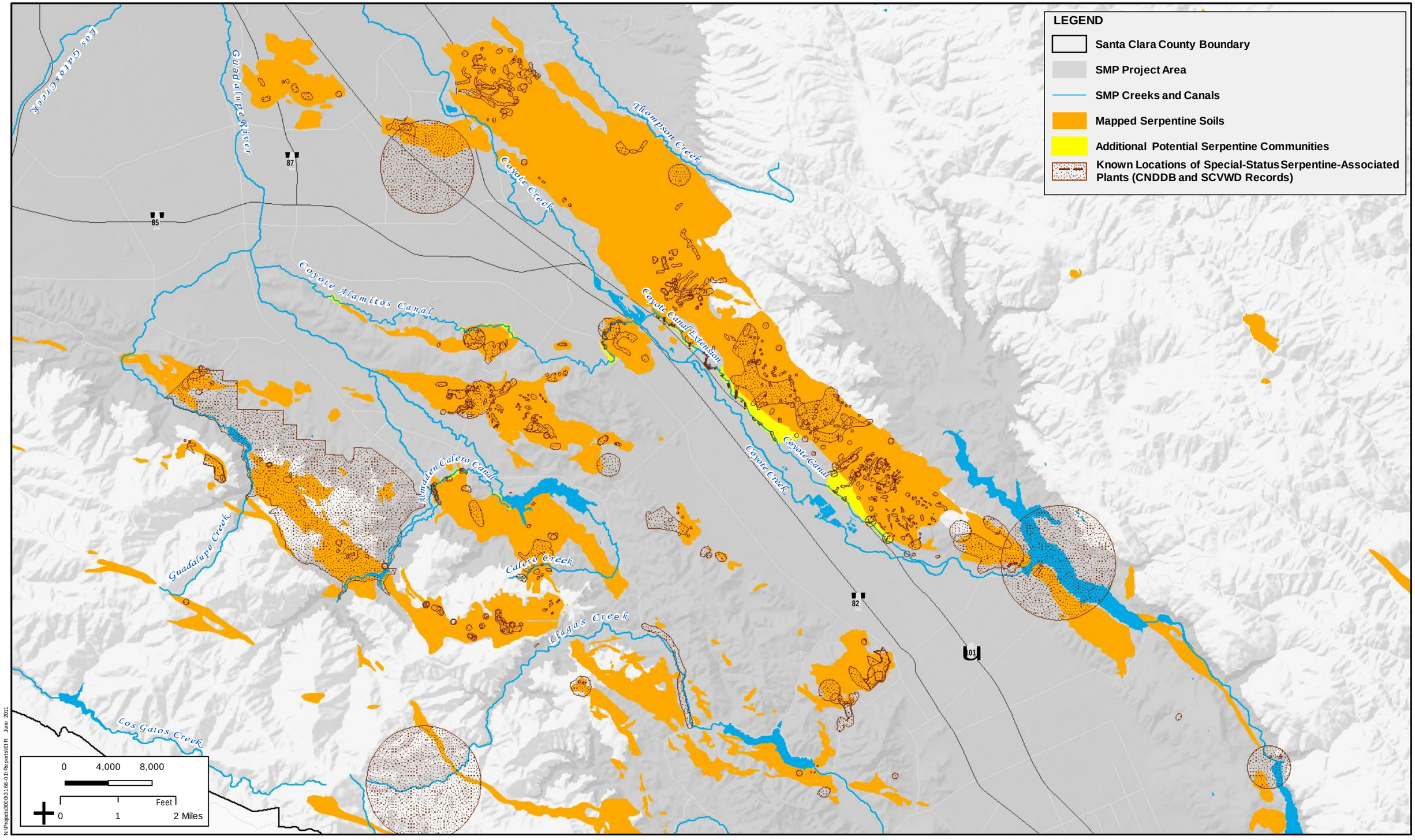

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Figure 3.3-3: Mapped Serpentine Soils and Known Locations of Special-Status Serpentine-Associated Plants

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Calero canals cannot be eliminated. Thus, because Tiburon paintbrush and Coyote ceanothus are so rare that any new occurrence would be significant to the population, and any loss of individuals or degradation of the health of the population would result in a substantial adverse effect on the species, SCVWD would implement BMP GEN-9 (*Avoid Impacts to Special-Status Plant Species and Sensitive Natural Vegetation Communities*) to prevent all direct and indirect effects on these species. Individuals of these species would be sought during pre-activity surveys along the segments of the aforementioned canals that are located within serpentine communities and, if any individuals were found, Proposed Project activities would be modified to prevent adverse effects on them. Thus, with implementation of BMPs, no short- or long-term effects on the Tiburon paintbrush and Coyote ceanothus are expected to occur.

Several of the special-status plants listed above are known to occur in or near proposed work sites. During SCVWD's 2004 and 2008 surveys of SMP channels within serpentine communities, both the federally listed Santa Clara Valley dudleya and Metcalf Canyon jewel-flower were documented within SCVWD canal easement (Figure 3.3-3). Santa Clara Valley dudleya was documented along the Coyote Alamitos Canal, the Coyote Canal Extension, and the Almaden Calero Canal. One population of Metcalf Canyon jewel-flower was documented along the Coyote Canal Extension. Other special-status serpentine-associated plant species located in SMP work sites during SCVWD's 2004 and 2008 surveys included Mt. Hamilton thistle, smooth lessingia, Hall's bush-mallow, and most beautiful jewel-flower. Although none of the remaining serpentine-associated species listed above were detected during these surveys, serpentine soils similar to those that support known populations occur in the Project Area throughout much of Coyote Ridge, on Tulare Hill, and in the Santa Teresa Hills. Thus, some potential would exist to find serpentine bunchgrass grassland, rock outcrops, seeps, and mixed serpentine chaparral habitat virtually anywhere in the Project Area that may support these species.

As was discussed for serpentine communities under Impact BIO-3, projected activities would occur in or very close to serpentine communities primarily along portions of the Coyote Canal, Coyote Canal Extension, Coyote Alamitos Canal, and Almaden Calero Canal where high-quality serpentine communities were mapped by SCVWD botanist J. Hillman, based on surveys in 2004 and 2008 (Figure 3.3-2).

Although serpentine communities occurred near SMP work sites elsewhere, such as along Upper Silver Creek, no high-quality serpentine communities were identified in these areas during SCVWD's surveys. As described under *Determination of Impacts to Special-Status Plants*, proposed maintenance activities could result in a variety of short-term impacts on serpentine-associated special-status plants. For example, during any bank stabilization, sediment removal, vegetation management, and animal conflict management activity that occurred in or adjacent to serpentine communities, equipment use, vehicle traffic, and worker foot traffic may result in the injury or mortality of individual plants. These activities could result in death, altered growth, or reduced seed set by the physical breaking, crushing, wilting, or uprooting of plants, and soil compaction by heavy equipment could damage plant roots. In addition, vegetation management activities and the creation of access routes and staging areas may result in the mechanical or physical removal of special-status plants and the damage or mortality of individuals as a result of off-target herbicide contact via drift. Although such impacts to habitat of these species would be temporary in that they would not preclude the regeneration of serpentine

vegetation and the recolonization of these areas by special-status plants, the repetitive nature of impacts in at least some would result in longer-term effects over the 10-year duration of the SMP Update. Permanent impacts to serpentine-associated special-status plants may occur if bank stabilization activities were necessary in occupied habitat. Unprojected activities (e.g., bank stabilization, management of animal conflicts, and minor maintenance) also could result in the loss or disturbance of serpentine-associated special-status plant populations.

As discussed for serpentine communities under Impact BIO-3, SMP Update activities are projected to impact up to 5.04 linear miles of canal within high-quality serpentine communities. Assuming (conservatively) that areas up to 20 ft on either side of the canal could be impacted, projected activities could impact up to 24.43 ac of high-quality serpentine communities. Although special-status serpentine-associated plants occur in only a subset of this area, there is some potential for impacts to populations of these species throughout that area.

SCVWD would implement several measures to address the impact of Proposed Project activities, including pre-project planning BMPs to minimize the area of disturbance. Implementation of the BMP specifically designed to protect special-status plants (BMP GEN-9) would avoid or minimize impacts to these species through the identification and avoidance of serpentine and serpentine-associated special-status species. These BMPs are as follows, and a description of each is provided in Table 2-12.

Applicable Best Management Practices

BMP GEN-4: Minimize the Area of Disturbance
BMP GEN-9: Avoid Impacts to Special-Status Plant Species and Sensitive Natural Vegetation Communities
BMP GEN-21: Staging and Stockpiling of Materials

Conclusion

By implementing these BMPs, SCVWD would reduce impacts to serpentine-associated special-status plant species. However, complete avoidance of special-status serpentine-associated plant species would be infeasible. Impacts would most likely occur if special-status serpentine plants were located within a levee road or on a canal bank between the access road and the canal, if sediment on which Mt. Hamilton thistle was growing needed to be removed, or if unprojected maintenance activities occurred in areas where avoidance of serpentine habitats and species was not feasible. If impacts to special-status serpentine plants was unavoidable, such impacts would be significant because of their regional rarity (Significance Criteria A and B). Mitigation Measure BIO-4 would be implemented to provide compensation for these impacts, reducing the impact on serpentine-associated special-status plant species to a less-than-significant level.

Implementation of Mitigation Measure BIO-3 for serpentine plant communities would help to reduce impacts to special-status serpentine-associated plants by providing compensation for impacts to high-quality occurrences of communities in which these special-status species occurred. However, Mitigation Measure BIO-4 still would be necessary so that mitigation specific to the impacted species was provided. Mitigation

Measure BIO-4 would be implemented to reduce the impact to serpentine-associated special-status plant species to a less-than-significant level.

Mitigation Measure BIO-4: Implement Compensatory Mitigation for Serpentine-Associated Special-Status Plant Species

SCVWD will provide mitigation for unavoidable impacts to serpentine-associated special-status plant populations. Before Proposed Project activities that can impact serpentine communities and species, an SCVWD botanist will conduct a review of potential serpentine impact areas using existing data, such as SCVWD's mapping, and field verification as needed, to identify high-quality serpentine communities. The botanist also will conduct a pre-activity survey for special-status plants. At the end of that year's maintenance period, SCVWD would refine the quantification of impacts to populations of special-status serpentine-associated plants.

Compensation for unavoidable impacts to populations of special-status serpentine-associated plants will be provided by a combination of preservation and enhancement of those species' populations outside SMP work sites. For impacts to populations (including partial populations) of a specific special-status serpentine plant species, compensatory mitigation will include preservation, enhancement, and management of lands that (a) already support equal or greater numbers (and health) of individuals of that species and (b) contain sufficient unoccupied habitat to allow for an increase in populations, the increase being at least equivalent to the number impacted, through habitat enhancement and management. For determining the number of individuals impacted, the highest number of individuals known to be present within the impact area (if the impact area has undergone multiple surveys) will be used to determine the magnitude of the impact.

Compensatory mitigation for impacts to high-quality serpentine communities (as discussed in Mitigation Measure BIO-3) and special-status serpentine-associated plants may occur on the same lands, provided that the conditions pertaining to special-status plant species are satisfied for each species for which mitigation is required. The HMMP that will be prepared by SCVWD to describe the measures that will be taken to enhance, manage, and monitor the mitigation lands (as discussed in Mitigation Measure BIO-3) also will include consideration of focal special-status species. For example, in addition to the measures described in Mitigation Measure BIO-3, the HMMP also will include the following:

- A summary of impacts to special-status plant populations and the proposed mitigation
- A description of measures to be undertaken if necessary to enhance (e.g., through focused management) the mitigation site for special-status species
- A description of measures to transplant individual plants or seeds from the impact area to the mitigation site, if determined by a qualified botanist to be appropriate and to have a high likelihood of success
- Proposed management activities, such as managed grazing and management of invasive plants, to maintain high-quality habitat conditions for the focal species

- A description of species monitoring measures on the mitigation site, including specific, objective goals and objectives (including enhancement of populations of focal special-status species on the mitigation site), performance indicators and success criteria (including increasing the abundance of the focal species by at least as many individuals as were impacted), monitoring methods (including sampling for the focal species), data analysis, reporting requirements, and monitoring schedule. Determining other specific performance/success criteria requires information regarding the specific mitigation site, its conditions, the biological resources present on the site, the specific plant species for which mitigation is being provided, and the specific enhancement and management measures tailored to the mitigation site and its conditions. As a result, additional specific criteria will be defined in the HMMP rather than in this SEIR. Nevertheless, the performance/success criteria described in the HMMP will guide mitigation to manage and protect high-quality serpentine habitat for, and populations of, the impacted species. The HMMP will include monitoring for non-native plant species and remediation measures in the event that such species are detected on the site.

After mitigation has been provided for impacts to special-status plant populations in a specific area from a specific year's activities, future (i.e., repetitive) impacts to that area will not require additional mitigation.

The HMMP will be provided to the USFWS for review because some of the serpentine-associated special-status species for which the HMMP will be prepared are federally listed species regulated by the USFWS. It is possible that this mitigation measure may be refined during the Section 7 consultation process with the USFWS (e.g., in the Biological Opinion covering Project effects on federally listed, serpentine-associated species), in which case the refinements required by the USFWS would be implemented.

MM BIO-4 will mitigate impacts to special-status serpentine-associated plants to less-than-significant levels by enhancing, managing, and protecting populations of these species so that the SMP does not substantially reduce the number or restrict the range of rare or endangered serpentine-associated plants or have a substantial adverse effect on special-status serpentine-associated plants.

Impact BIO-5: Impacts to Non-Serpentine Special-Status Plant Species (Significance Criteria A and B; Less than Significant with Mitigation)

Special-status plants, typically not strongly associated with serpentine communities and instead typically occurring in communities such as valley and foothill grassland and riparian woodland, are present in the Project Area (see Figure 3.3-4 and Table 3.3-~~20~~21). Thus, maintenance activities involving the removal of upland vegetation or ground disturbance could have impacts on the following special-status plant species:

- Franciscan onion (*Allium peninsulare* var. *franciscanum*)
- Bent-flowered fiddleneck (*Amsinckia lunaris*)
- Anderson's manzanita (*Arctostaphylos andersonii*)
- Brittlescale (*Atriplex depressa*)

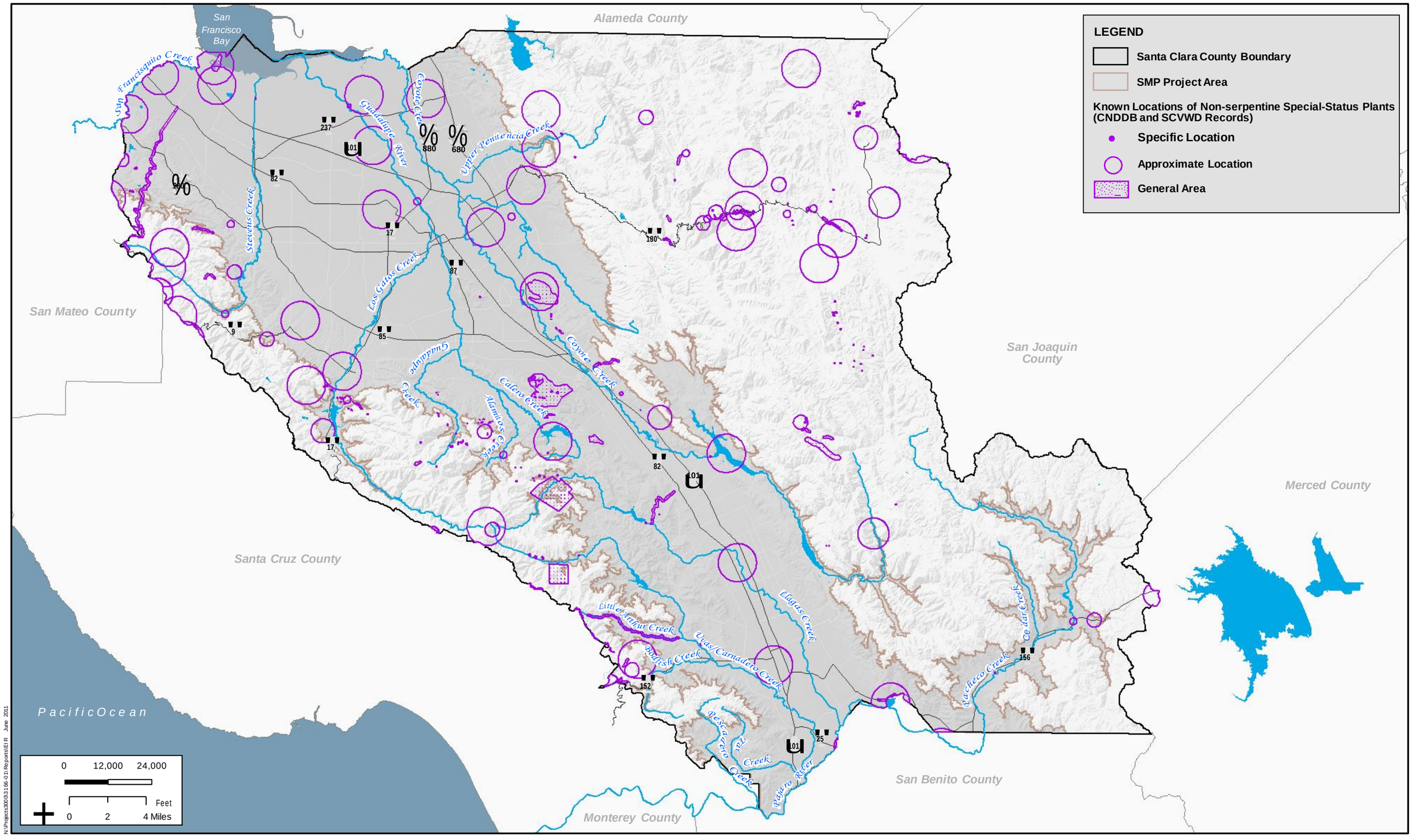

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Figure 3.3-4: Known Locations of Non-serpentine Special-Status Plants
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- Round-leaved filaree (*Erodium macrophyllum*)
- Congdon's tarplant (*Hemizonia parryi* ssp. *congdonii*)
- Santa Clara red ribbons (*Clarkia concinna* ssp. *automixa*)
- Hospital Canyon larkspur (*Delphinium californicum* ssp. *interius*)
- Western leatherwood (*Dirca occidentalis*)
- Hoover's button-celery (*Eryngium aristulatum* var. *hooveri*)
- Satan's goldenbush (*Isocoma menziesii* var. *diabolica*)
- Showy golden madia (*Madia radiata*)
- Davidson's bush-mallow (*Malacothamnus davidsonii*)
- Hall's bush-mallow (*Malacothamnus hallii*)
- Loma Prieta hoita (*Hoita strobilina*)
- San Francisco collinsia (*Collinsia multicolor*)
- Oregon meconella (*Meconella oregana*)
- Mt. Diablo cottonweed (*Micropus amphibolus*)
- Robust monardella (*Monardella villosa* ssp. *globosa*)
- Hooked popcorn-flower (*Plagiobothrys uncinatus*)
- Saline clover (*Trifolium depauperatum* var. *hydrophilum*)

As discussed under Determination of Impacts to Special-Status Plants, proposed maintenance activities may result in direct and indirect impacts on these species as a result of trampling by personnel and equipment; soil compaction leading to damage of roots; or alteration of hydrology and mechanical, physical, or chemical removal of vegetation. Because these species generally are not associated with a single vegetation or soil type, as is the case with the serpentine-associated special-status species considered under Impact BIO-4, site-specific impacts to these species resulting from Proposed Project activities are difficult to predict. However, each of the species listed above has some potential to occur in areas where they could be adversely affected by Proposed Project activities.

Santa Clara red ribbons, Hospital Canyon larkspur, and robust monardella are each known from numerous reported occurrences in the Project Area. However, these upland species are expected to occur infrequently and in low numbers in riparian areas where Proposed Project activities would be focused. Thus, the Proposed Project likely would have an adverse affect on only a very small proportion of the regional populations of these species, and possibly most of these species would not be affected at all. Because the effects of maintenance activities are not expected to rise to the threshold of a *substantial* adverse effect on regional populations, Proposed Project impacts to these species will be less than significant.

Round-leaved filaree, Congdon's tarplant, Hoover's button-celery, Satan's goldenbush, showy golden madia, San Francisco collinsia, western leatherwood, and Mt. Diablo cottonweed are each known from only a few locations in the Project Area. As a result, little potential would exist for impacts to these species. However, any impacts on these species as a result of the Proposed Project may result in a substantial effect on the species' regional populations because of their greater rarity in the region, compared to the species discussed in the previous paragraph. Thus, this impact would be significant (Significance Criterion B). In addition, Hall's bush mallow is known to occur on the Coyote Canal Extension within an SMP work site. During surveys by SCVWD botanists in 2004 and 2008, four occurrences totaling up to 55 individuals were recorded. Canal maintenance,

particularly vegetation management, could result in the loss of these individuals. Because of the regional rarity and relatively low number of regional occurrences of Hall's bush mallow, this impact would be significant.

Occurrences of Franciscan onion, bent-flowered fiddleneck, Anderson's manzanita, brittlescale, hooked popcorn flower, Oregon meconella, and saline clover are unknown in the Project Area. However, suitable habitat for these species is present and, because of the lack of comprehensive surveys of all SMP work sites (which would be infeasible because of the extent of the Project), the possibility of occurrence of these species within a work site could not be dismissed. Because these species have not been recorded in the Project Area, possibly they would not be impacted at all. Nevertheless, any impacts to newly discovered populations of these species in the Project Area would be considered significant, as the population would represent an extension of the species' known distribution (Significance Criteria A and B). Similarly, Davidson's bush-mallow is known from the Project Area only, from three historical records dating back to 1936. Thus, any impacts to newly discovered populations of this species in the Project Area would be considered significant (Significance Criteria A and B).

SCVWD would implement pre-project planning BMPs, including limiting impacts to the minimum area required, to address the impact of Proposed Project activities on non-serpentine special-status plant species. In addition, implementation of the BMP specifically designed to protect special-status plants and sensitive communities would avoid impacts to these species through the identification and avoidance of occupied habitat. These BMPs are as follows, and a description of each is provided in Table 2-12.

Applicable Best Management Practices

BMP GEN-4: Minimize the Area of Disturbance
BMP GEN-9: Avoid Impacts to Special-Status Plant Species and Sensitive Natural Vegetation Communities

Conclusion

By implementing these BMPs, SCVWD would reduce impacts to non-serpentine special-status plants by avoiding both direct and indirect impacts to these species. However, circumstances may arise in which complete avoidance of special-status plants was infeasible. For example, unprojected maintenance activities may need to occur in areas where avoidance of occurrences was infeasible because complete avoidance could not be accomplished while still meeting the project goals for public health and safety directives. If impacts to populations or partial populations of the round-leaved filaree, Congdon's tarplant, Hoover's button-celery, Satan's goldenbush, showy golden madia, Davidson's bush-mallow, Mt. Diablo cottonweed, Franciscan onion, bent-flowered fiddleneck, Anderson's manzanita, brittlescale, hooked popcorn flower, Hall's bush mallow, Oregon meconella, or saline clover were unavoidable, such impacts would be significant (Significance Criteria A and B).

Mitigation Measure BIO-5 would be implemented to reduce impacts to non-serpentine special-status plant species to a less-than-significant level.

Mitigation Measure BIO-5: Implement Compensatory Mitigation for Impacts to Non-Serpentine Special-Status Plant Species

If Proposed Project activities result in the loss of individual non-serpentine special-status plants, other than the Santa Clara red ribbons, Hospital Canyon larkspur, western leatherwood, Hall's bush-mallow, and robust Monardella, compensatory mitigation will be provided. Before Proposed Project activities that can impact these special-status species, an SCVWD botanist will conduct a review of potential impact areas using existing data, and field verification as needed, to identify areas of potential occurrence of these species. The botanist also will conduct a pre-activity survey for special-status plants in areas where occurrence is possible. At the end of that year's maintenance period, SCVWD will determine the extent of impacts to populations of these special-status plants.

Compensation for unavoidable impacts to populations of special-status non-serpentine plants will be provided by a combination of preservation and enhancement of those species' populations outside SMP work sites. For impacts to populations (including partial populations) of a specific special-status plant species, compensatory mitigation will include preservation, enhancement, and management of lands that (a) already support equal or greater numbers (and health) of individuals of that species and (b) contain sufficient unoccupied habitat to allow for an increase in populations, the increase being at least equivalent to the number impacted, through habitat enhancement and management. For determining the number of individuals impacted, the highest number of individuals known to be present within the impact area (if the impact area has undergone multiple surveys) will be used to determine the magnitude of the impact.

SCVWD will develop an HMMP describing the measures that will be taken to enhance and manage the mitigation lands and to monitor the effects of management on the focal special-status plant species. That plan will include, at a minimum, the following:

- A summary of impacts to special-status plant populations, and the proposed mitigation
- A description of the location and boundaries of the mitigation site and description of existing site conditions
- A description of measures to be undertaken if necessary to enhance (e.g., through focused management) the mitigation site for special-status species
- A description of measures to transplant individual plants or seeds from the impact area to the mitigation site, if determined by a qualified botanist to be appropriate and to have a high likelihood of success
- Proposed management activities to maintain high-quality habitat conditions for the focal species
- A description of species monitoring measures on the mitigation site, including specific, objective goals and objectives <u>(including enhancement of populations of focal special-status species on the mitigation site)</u>, performance indicators <u>and</u> success criteria <u>(including increasing the abundance of the focal species by at least as many individuals as were impacted)</u>, monitoring methods <u>(including sampling for the focal species)</u>,

data analysis, reporting requirements, and monitoring schedule. Determining other specific performance/success criteria requires information regarding the specific mitigation site, its conditions, the biological resources present on the site, the specific plant species for which mitigation is being provided, and the specific enhancement and management measures tailored to the mitigation site and its conditions. As a result, additional~~those~~ specific criteria will be defined in the HMMP rather than in this SEIR. Nevertheless, the performance/success criteria described in the HMMP will guide the mitigation to manage and protect high-quality habitat for, and populations of, the impacted species. The HMMP will include monitoring for non-native plant species and remediation measures in the event that such species are detected on the site.

- A description of the management plan's adaptive component, including potential contingency measures for mitigation elements that do not meet performance criteria
- A description of the funding mechanism for the long-term maintenance and monitoring of the mitigation lands

After mitigation has been provided for impacts to a specific area supporting special-status species from a specific year's activities, future (i.e., repetitive) impacts to that area will not require additional mitigation.

MM BIO-5 will mitigate impacts to special-status non-serpentine plants to less-than-significant levels by enhancing, managing, and protecting populations of these species so that the SMP does not substantially reduce the number or restrict the range of rare or endangered non-serpentine plants or have a substantial adverse effect on special-status non-serpentine plants.

Impact BIO-6: Impacts to Serpentine-Associated Special-Status Invertebrates (Significance Criteria A and B; Less than Significant with Mitigation)

Serpentine-associated invertebrate species including the Bay checkerspot butterfly, Hom's micro-blind harvestman (*Microcina homi*), Jung's micro-blind harvestman (*Microcina jungi*), and Opler's longhorn moth (*Adela oplerella*) may be affected by projected activities that occurred along canals running through serpentine habitats. As was discussed for serpentine communities under Impact BIO-3, projected activities would occur in or very close to serpentine communities, primarily along portions of the Coyote Canal, Coyote Canal Extension, Coyote Alamitos Canal, and Almaden Calero Canal where high-quality serpentine communities were mapped by SCVWD botanist J. Hillman during surveys in 2004 and 2008 (Figure 3.3-2). Projected activities along Upper Silver Creek, Coyote Creek, Coyote Canal Extension, Coyote Canal, Coyote Alamitos Canal, and Almaden Calero Canal (totaling 7.58 acres) would occur within designated critical habitat for the Bay checkerspot butterfly. Because the Bay checkerspot butterfly typically occurs high on hillsides in the Project Area rather than the lower locations of these canals, impacts to occupied Bay checkerspot butterfly habitat (and individuals) in work sites would be very limited, if in fact any such impacts were to occur at all. Figure 3.3-5 indicates the distribution of the Bay checkerspot butterfly and its designated critical habitat in the Project Area.

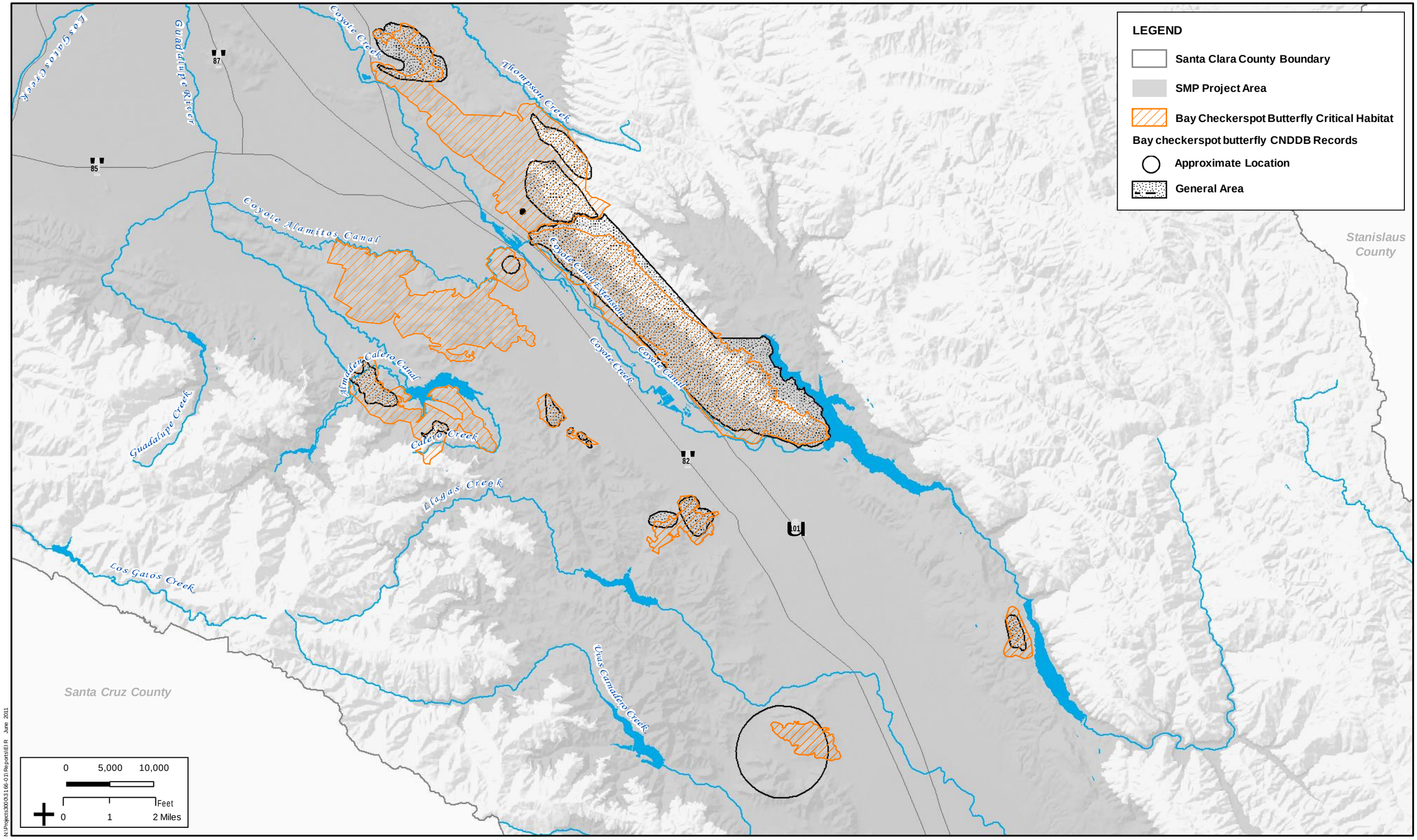

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Figure 3.3-5: Bay Checkerspot Butterfly Distribution in Santa Clara County

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Furthermore, some projected activities would occur in or very close to serpentine habitats along portions of Upper Silver Creek and Coyote Creek (Figure 3.3-2). No high-quality serpentine communities were identified in work sites during SCVWD's surveys. As a result, the Bay checkerspot butterfly would be unlikely to occur in such areas, and a low probability exists that the other serpentine-associated invertebrate species (i.e., Hom's micro-blind harvestman, Jung's micro-blind harvestman, and Opler's longhorn moth) would be present in these areas.

Proposed Project activities in serpentine habitat may include spot-removal of sediment plugs from the canals themselves, vegetation management along the tops and inboard sides of the levees/roads immediately adjacent to canals, vegetation management activities within the canal, and animal conflict management. As described under *Determination of Impacts to Wildlife and Fisheries*, these activities could result in the direct mortality or injury of special-status invertebrates associated with serpentine communities.

Suitable habitat for the Bay checkerspot's larval and adult food plants (i.e., dwarf plantain, purple owl's-clover, and exserted paintbrush) occurs in upland areas along the edges of the canals, and in and along the canal-side levee roads. In particular, dwarf plantain can be locally abundant in disturbed areas such as levees. Thus, these species may be impacted by people or equipment moving along the sides of the canals during access to canal work sites, or by activities that focused on the maintenance of the canal-side roads and levees, such as mowing, herbicide application, and animal conflict management.

Equipment use, vehicle traffic, and worker foot traffic along canals may result in the injury or mortality of serpentine dependent invertebrates including the Bay checkerspot butterfly (larvae and pupae) and its host plants (e.g., physically breaking, crushing, wilting, or uprooting plants and damaging their roots as a result of soil disturbance by heavy equipment). Additionally, butterflies and their host plants may suffer injury or mortality as a result of vegetation clearing for access roads and staging areas. Impacts to Opler's longhorn moth would be similar, although because the two harvestman species typically occur in or under rocks, Proposed Project activities likely would have little effect on these species.

As discussed for serpentine communities under Impact BIO-3, SMP Update activities are projected to impact up to 5.04 linear miles of canal within high-quality serpentine communities. Assuming (conservatively) that areas up to 20 feet on either side of the canal could be impacted, projected activities could impact up to 24.43 acres of high-quality serpentine communities. Although special-status, serpentine-associated invertebrates may occur in only a subset of this area, some potential would exist for impacts to populations of these species throughout that area.

SCVWD would implement several measures to address the impact of Proposed Project activities on serpentine-dependent special-status animal species, including pre-project planning BMPs to minimize the area of disturbance. Implementation of the BMPs specifically designed to protect sensitive natural communities and to avoid impacts to the Bay checkerspot butterfly and its critical habitat would avoid or minimize impacts to these species by the identification and avoidance of serpentine habitat and serpentine-dependent special-status species. These BMPs are as follows, and a description of each is provided in Table 2-12.

Applicable Best Management Practices

BMP GEN-4: Minimize the Area of Disturbance
BMP GEN-9: Avoid Impacts to Special-Status Plant Species and Sensitive Natural Vegetation Communities
BMP GEN-10: Avoid Impacts to Bay Checkerspot Butterfly and Associated Critical Habitat
BMP GEN-21: Staging and Stockpiling of Materials

Conclusion

By implementing these BMPs, SCVWD is expected to be able to reduce impacts to serpentine-associated special-status species. Nevertheless, the Proposed Project may result in residual impacts to special-status serpentine-associated invertebrates and their habitats because complete avoidance could not be accomplished while still meeting the project goals for public health and safety directives. This impact would be significant because of the regional rarity of these species (Significance Criteria A and B). Implementation of Mitigation Measure BIO-6 would reduce this residual impact to a less-than-significant level. Implementation of Mitigation Measure BIO-3 for serpentine plant communities and Mitigation Measure BIO-4 for serpentine-associated special-status plant populations would help to reduce impacts to special-status serpentine-associated invertebrates by providing compensation for impacts to high-quality occurrences of the communities in which these special-status species typically occur. However, Mitigation Measure BIO-6 still would be necessary to assure mitigation specific to the special-status invertebrate species that were impacted was provided. Mitigation Measure BIO-6 would be implemented to reduce the impact to serpentine-associated special-status invertebrates to a less-than-significant level.

Mitigation Measure BIO-6: Implement Compensatory Mitigation for Impacts to Serpentine-Associated Special-Status Invertebrates

SCVWD will compensate for its impacts to populations and habitat of serpentine-associated special-status invertebrates through the preservation and management of serpentine communities as described for Mitigation Measure BIO-3. The procedures for identifying impacts to potential habitat of these species will occur as described for serpentine communities under Mitigation Measure BIO-3. Mitigation lands will be preserved and managed as described for Mitigation Measure BIO-3 as well, with the qualification that for any impacts to high-quality serpentine communities within Bay checkerspot butterfly critical habitat, the compensatory mitigation lands also must be in Bay checkerspot critical habitat. The management and monitoring of mitigation lands, as described in the HMMP, will include measures specifically targeting the Bay checkerspot butterfly, which will serve as a proxy for the other special-status invertebrates.

The HMMP will be provided to the USFWS for review because one of the serpentine-associated special-status species (Bay checkerspot butterfly) for which this HMMP will be prepared is a federally listed species regulated by the USFWS. It is possible that this mitigation measure may be refined during the Section 7 consultation process with the USFWS (e.g., in the Biological Opinion covering Project effects on the Bay checkerspot butterfly), in which case the refinements required by the USFWS would be implemented.

MM BIO-6 will mitigate impacts to serpentine-associated special-status invertebrates to less-than-significant levels by enhancing, managing, and protecting populations of these species so that the SMP does not substantially reduce the number or restrict the range of rare or endangered serpentine-associated invertebrates or have a substantial adverse effect on special-status serpentine-associated invertebrates.

Impact BIO-7: Loss of Ordinance Trees (Significance Criterion F; Less than Significant with Mitigation)

For the purposes of the SMP Update, unless an agreement between SCVWD and a municipality states otherwise, ordinance trees are defined based on the applicable local ordinance. Often, ordinance trees must meet a minimum size requirement. However, some ordinances are not size-based but species based (e.g., all oaks) and, in some cases, no distinction is made between native and non-native species. Ordinance-sized trees are common in many of the riparian habitats along the creeks that are maintained by SCVWD, and they are present in some non-instream areas as well. In addition to providing riparian functions and values, as described in the habitats section above, larger trees are particularly valuable because they provide the highest-quality nesting sites for raptors, they may contain cavities that serve as roost sites for bats or nesting/denning sites for other animals, they provide large amounts of coarse woody debris to the stream ecosystem, and they promote high foliage height diversity, which in turn increases the local diversity of birds. They also provide important shading and aesthetic values. As a result of their high value, such trees are protected by local ordinances of Santa Clara County and a number of municipalities within SCVWD's jurisdictional area. Thus, these trees merit special consideration in assessing impacts of the Proposed Project.

Removal of all hazard trees and trees greater than 12 inches dbh is not included in the SMP Update. As a result, few ordinance trees are likely to be impacted by Proposed Project activities. Nevertheless, vegetation management and bank stabilization activities associated with the Proposed Project may result in the removal of ordinance trees, and some potential would exist for all Proposed Project activities indirectly to affect the health of ordinance trees through herbicide application or damage to roots resulting from the movement of heavy equipment.

SCVWD would implement a pre-project planning BMP, limiting impacts to the minimum area required, to address the impact of Proposed Project activities on ordinance trees. This BMP is as follows; a description of this BMP is provided in Table 2-12.

Applicable Best Management Practices

BMP GEN-4: Minimize the Area of Disturbance

Conclusion

Implementation of BMP GEN-4 would minimize the loss of ordinance trees, but complete avoidance of these trees may not be practicable. In the absence of mitigation measures, this impact would be significant in accordance with Significance Criterion F. When direct removal of ordinance trees by SCVWD could not be avoided, Mitigation Measure BIO-7 would be implemented to reduce residual impacts to a less-than-significant level.

Mitigation Measure BIO-7: Tree Replacement

The SCVWD will replace ordinance trees as follows. As discussed under Mitigation Measure BIO-2, removal of trees sized 6-12 inches dbh will be mitigated through the individual planting of replacement trees. Section 5.5 in Appendix C (*Mitigation for Tree and Shrub Removals 6–12 inches dbh*) provides a specific tree appraisal and evaluation protocol to determine how replacement planting should occur. The protocol in Section 5.5 of Appendix C will involve carefully assessing targeted tree removals for their existing conditions and functions, including their canopy cover, local area value, ecosystem benefits, and ecosystem detriments. Using a cumulative ranking method, tree replacement mitigation ratios for removed trees (6-12 inches dbh) will occur at either 1:1, 2:1, or 3:1 (replacement tree to removed tree), depending on the overall quality and function of the removed tree. Therefore, if any trees 6-12 inches dbh that are removed are ordinance trees (depending on the locality in which tree removal occurs), then mitigation will be provided as described in Section 5.5 of Appendix C.

It is possible that this mitigation measure may be refined during the permitting process by the USACE, CDFG, or RWQCB, in which case the refinements required by these agencies would be implemented.

MM BIO-7 will mitigate impacts to ordinance trees to less-than-significant levels by replacing trees that are removed so that the SMP does not conflict with the provisions of local tree ordinances.

Impact BIO-8: Impacts on Steelhead (Significance Criteria A, B, and E; Less than Significant with Mitigation)

The federally listed steelhead, including both the Central California Coast (CCC) steelhead and the South-Central California Coast (SCCC) steelhead, rely on adequate flows, water temperatures, water depths, and velocities; appropriate spawning and rearing substrates (e.g., riverbed gravels); and availability of instream cover and food for survival and reproduction in the creeks of the Project Area. Proposed maintenance activities may significantly alter these conditions and result in the direct injury or mortality of these fish as generally described under *Determination of Impacts to Wildlife and Fisheries*.

Effects of bank stabilization on steelhead would depend largely on their use of the affected reach, the existing (pre-stabilization) condition of the bank, and the stabilization methods that were employed. For example, along reaches used solely for fish passage between spawning/rearing locations and San Francisco Bay, bank stabilization activities would be unlikely to have a substantial impact regardless of the stabilization methods employed. Conversely, bank stabilization activities within spawning or rearing habitat, or upstream from such habitats, may have more substantial effects on steelhead and their habitats. Replacement of a natural or "soft" bank, especially one supporting riparian vegetation, with "hard" substrate such as concrete or riprap that was not conducive to riparian revegetation would be likely to result in an adverse effect on steelhead habitat. In contrast, replacement of a hardened bank with softer stabilization methods, especially those that enhanced instream complexity, would result in a considerable net benefit to steelhead by increasing habitat complexity and enhancing refugia, pool-riffle complexes, and rearing habitat. SCVWD would prioritize the use of soft stabilization methods that provided these

benefits. Bank stabilization also could lead to degradation of habitat through the loss of undercut banks.

The extent of potential impacts to steelhead and their habitat resulting from bank stabilization activities is difficult to quantify, because stabilization activities cannot be projected and because the magnitude of the impact of stabilization would depend on the type of repair method used and the location of the repair project. However, the extent of bank stabilization work that is expected to occur in steelhead habitat would be relatively low, based on SMP activities conducted since 2002. Between 2002 and 2010, ~~(approximately~~ less than 1 mile of bank stabilization work per year has occurred throughout the Project Area, including non-steelhead streams~~)~~. SCVWD's records indicate that less than 20 percent of this bank stabilization work occurred in unmodified channels, which likely provide the highest-quality habitat for steelhead. Furthermore, SCVWD expects that no more than half of the bank repairs during the period 2012–2022 to consist of impervious hardscape bank stabilization work. As a result, and because of the potential long-term benefits of bank stabilization to steelhead habitat described above, little long-term adverse impact to steelhead habitat is expected to occur as a result of 2012–2022 bank stabilization activities.

Before work within an active channel that contains water, the reach would be dewatered. By implementing BMP GEN-15, fish would be relocated from streams supporting steelhead to minimize mortality and implementing BMP GEN-1 would limit in-channel activities to the period when steelhead would be least likely to be present. As a result, no adult steelhead are expected to be present in work sites when dewatering and fish relocation occur; and thus, no adults would be impacted by the maintenance activity or relocation. However, fry and juveniles may be present, especially if maintenance activities occurred near spawning or rearing habitat. During capture and relocation, fry and juveniles may be subjected to stress, injury, or mortality associated with netting, electrofishing, temporary captivity, and release into the relocation site. SCVWD fish relocation activities for the SMP from 2002–2009 resulted in a steelhead mortality rate of 0.9 percent (SCVWD 2002–2004, 2006–2009). Although the relocation sites would be carefully selected by SCVWD fisheries biologists based on criteria specified in the *Fish Relocation Guidelines*, some potential would exist for changes in temperature or water chemistry between the capture and release site, or densities of predators or competitors at the release site, to result in increased stress, injury, or mortality as well. Although the benefits of steelhead relocation would far outweigh the complete loss of individuals that would occur if fish were not relocated before dewatering took place, relocation could still result in adverse effects.

The main impact to steelhead resulting from sediment removal would be the removal of spawning gravel. Because projected 2012–2022 sediment removal activities would include some higher-elevation reaches where steelhead would be likely to spawn, such as in the Guadalupe River watershed, adverse effect of sediment removal on steelhead may occur because of the removal of gravel. Gravel removal would reduce the extent and availability of potential spawning habitat, and possibly rearing habitat, in the short term by removing existing spawning habitat and in the long term by reducing gravel supply within a creek.

Bank stabilization and sediment removal activities often necessitate the operation of heavy equipment within the stream bed (after dewatering). Movement of heavy equipment may compact the substrate, potentially killing benthic invertebrates (which may serve as prey

for steelhead), embedding gravel within finer sediments, and otherwise altering habitat for fish and their prey.

The locations where projected sediment removal would overlap steelhead habitat can be predicted and are shown in Figure 3.3-6. Sediment removal is projected to occur along approximately 12.61 miles of steelhead bearing streams from 2012–2022, with 11.34 miles in the Santa Clara Basin (thus affecting CCC steelhead) and 1.27 miles in the Pajaro Basin (thus affecting SCCC steelhead). Table 3.3-~~10~~11 summarizes the length of each steelhead-accessible creek in which sediment removal has been projected from 2012–2022. Although Figure 3.3-6 depicts the stream reaches in which sediment removal is projected, not every linear mile indicated as "projected" would actually undergo sediment removal. As explained in Chapter 2, *Project Description*, a "work area percentage" has been applied to some reaches in which only a certain percentage of the reach would undergo sediment removal. Table 3.3-~~10~~11 takes the "work area percentage" into account. As a result, the linear miles of sediment removal in Table 3.3-~~10~~11 represent only a certain percentage (the "work area percentage") of the projected work areas shown in Figure 3.3-6.

Table 3.3-~~10~~11. Projected Sediment Removal Work on Streams Supporting Steelhead, 2012–2022

Creek/River	Work Areas from 2002–2012, also projected for 2012–2022 (miles)	New Work Areas for 2012–2022 (miles)	Total Work Areas for 2012–2022 (miles)
Central California Coast Steelhead			
San Francisquito Creek	0.00	0.01	0.01
Stevens Creek	0.80	0.04	0.84
Guadalupe River/Creek	1.15	5.83	6.98
Alamitos Creek	0.01	0.31	0.32
Coyote Creek	0.00	2.64	2.64
Upper Penitencia Creek	0.01	0.42	0.43
Los Gatos Creek	0.00	0.08	0.08
Calero Creek	0.00	0.04	0.04
Subtotal	1.97	9.37	11.34
South-Central California Coast Steelhead			
Uvas/Carnadero Creek	0.00	0.04	0.04
Llagas Creek	0.38	0.84	1.22
Bodfish Creek	0.00	0.01	0.01
Subtotal	0.38	0.89	1.27
Total	2.35	10.26	12.61

Source: Data compiled by Horizon Water and Environment in 2011 based on information from SCVWD

Riparian vegetation serves a number of important roles for steelhead that would be altered by projected vegetation management activities, as discussed previously. However, Casagrande (2010), studying steelhead in Uvas Creek, found that steelhead grew much more quickly, and thus were much larger by their first winter, at less shaded, somewhat warmer sites, which had higher prey abundance compared to densely shaded, cooler sites. Casagrande verified that invertebrate biomass was considerably higher at less heavily shaded sites than under a dense forest canopy. His findings confirm those of other studies that demonstrate greater stream productivity (Murphy et al. 1981, Bilby and Bisson 1992, Quinn et al. 1997, Ambrose et al. 2004) and greater salmonid production (Wilzbach et al. 1986, 2005, Nislow and Lowe 2006) along reaches with lower canopy closure and higher light levels. Fish sampling by SCVWD in reaches below dense canopy has found very low densities of fish (of any species), apparently as a result of very low food densities (M. Moore, unpublished data). Therefore, thinning of vegetation as a result of the Proposed Project's vegetation management component may have benefits to steelhead, by increasing prey abundance in areas that are currently heavily shaded. In addition, larger steelhead tend to have higher winter survival, and thus the availability of conditions that would contribute to rapid growth, especially in the first year, could benefit steelhead populations considerably.

Vegetation management activities also would include the application of herbicides, as discussed above. Herbicides have the potential to result in impacts on steelhead as a direct effect on the survival, reproduction, and growth of individual steelhead, as well as indirect effects, such as reduction of the prey base or modification of their habitat. However, such effects would be minimized by SCVWD, using herbicide formulations approved for aquatic environments and adhering to state and federal regulations concerning herbicide use, as well as implementing SCVWD's BMPs.

USEPA has conducted ecological risk assessments to determine the potential risks of labeled uses of several herbicides, including three proposed for use by SCVWD (glyphosate, pendimethalin, and triclopyr) on Pacific salmonids. Evaluated herbicides proposed for use by SCVWD are as follows, with a summary of USEPA's effects determination:

- Glyphosate: for all uses with application rates of 5 pounds of active ingredient/acre or less, use results in <u>no effect</u> on the Central California Coast or South-Central California Coast steelhead. For application rates above 5 pounds active ingredient/acre, the pesticide may affect <u>but is not likely to adversely affect</u> these ESUs.
- Pendimethalin: <u>no effect</u> on the Central California Coast or South-Central California Coast steelhead.
- Triclopyr: may affect but <u>is not likely to adversely affect</u> the Central California Coast or South-Central California Coast steelhead.

SCVWD would use a surfactant to enhance the performance of herbicides. Surfactants aid the ability of a herbicide to penetrate the surface of vegetation, by increasing its ability to spread over vegetation, stick to foliage, and penetrate thick cuticles. Most aquatic herbicides either require or highly recommend the use of a surfactant to achieve reasonable levels of control. In instances where surfactants are absent from the tank mix, the level of control often is reduced. A reduction in control causes a greater return

frequency, which translates to more herbicide being used in the system and more frequent disturbance to the site.

In general, aquatic species (e.g., fish and amphibians) are more susceptible to adverse effects than terrestrial wildlife because of the potential for surfactants to alter cell permeability, thus increasing the potential for absorption of chemicals through their thin, moist skin. Some surfactants, particularly those that are nonylphenol-based, have been documented to result in chemical-induced lethargy and unconsciousness in fish, which can result in an increased risk of predation as well as cause estrogenic effects (Smith et al. 2004, USFS 2007). However, SCVWD proposes to limit surfactant use to the products that are documented to have the least toxic effect on aquatic life, Agri-dex and Competitor. Both of these surfactants are oil-based (Competitor is vegetable oil-based while the primary ingredient in Agri-dex is a paraffin-based oil) and function by increasing the absorption of herbicides through plant tissues. They are especially useful in increasing the penetration of herbicides through the bark of woody brush or tree stems (Bakke 2007). A study on the toxicity of surfactants to juvenile rainbow trout concluded that Agri-dex was less toxic to rainbow trout than two other commonly used surfactants, R-11 and LI 700 (Smith et al. 2004), and the *2006 Supplemental Environmental Assessment of NOAA Fisheries Implementation Plan for the Community Based Restoration Program* (NOAA 2006) concluded that was among the surfactants least toxic to marine and aquatic organisms (it is unknown whether Competitor was assessed).

The use of these pesticides and surfactants according to existing label directions and the California Department of Pesticide Regulation PRESCRIBE database, which provides information consistent with USEPA's Interim Measures Bulletins for Protection of Endangered Species for user-selected sites and pesticides, would minimize direct adverse effects on steelhead. However, herbicide use still could result in type conversion of riparian and wetland vegetation types, reduction in cover associated with vegetation, and modification of prey base for steelhead.

Vegetation management also is projected in the SMP Update. Therefore, the locations where projected vegetation management would overlap steelhead habitat can be predicted; these locations are shown in Figure 3.3-7 for instream herbicide application, Figure 3.3-8 for non-instream herbicide application, and Figure 3.3-9 for other vegetation management methods, such as hand removal, pruning, and mowing. Tables 3.3-~~11~~12, 3.3-~~12~~13, and 3.3-~~13~~14 summarize the length of each steelhead-accessible creek in which instream herbicide application, non-instream herbicide application, and manual vegetation management, respectively, are projected from 2012–2022.

Although Figures 3.3-7, 3.3-8, and 3.3-9 depict the stream reaches in which vegetation management activities are projected, not every linear mile indicated as “projected” in these figures would actually be subject to vegetation management. As explained previously, a “work area percentage” has been applied to some reaches in which only a certain percentage of the reach would undergo certain management activities. Tables 3.3-~~11~~12, 3.3-~~12~~13, and 3.3-~~13~~14 take the “work area percentage” into account, and thus the linear miles of sediment removal in these tables represent a subset of the projected work areas shown in the corresponding figures.

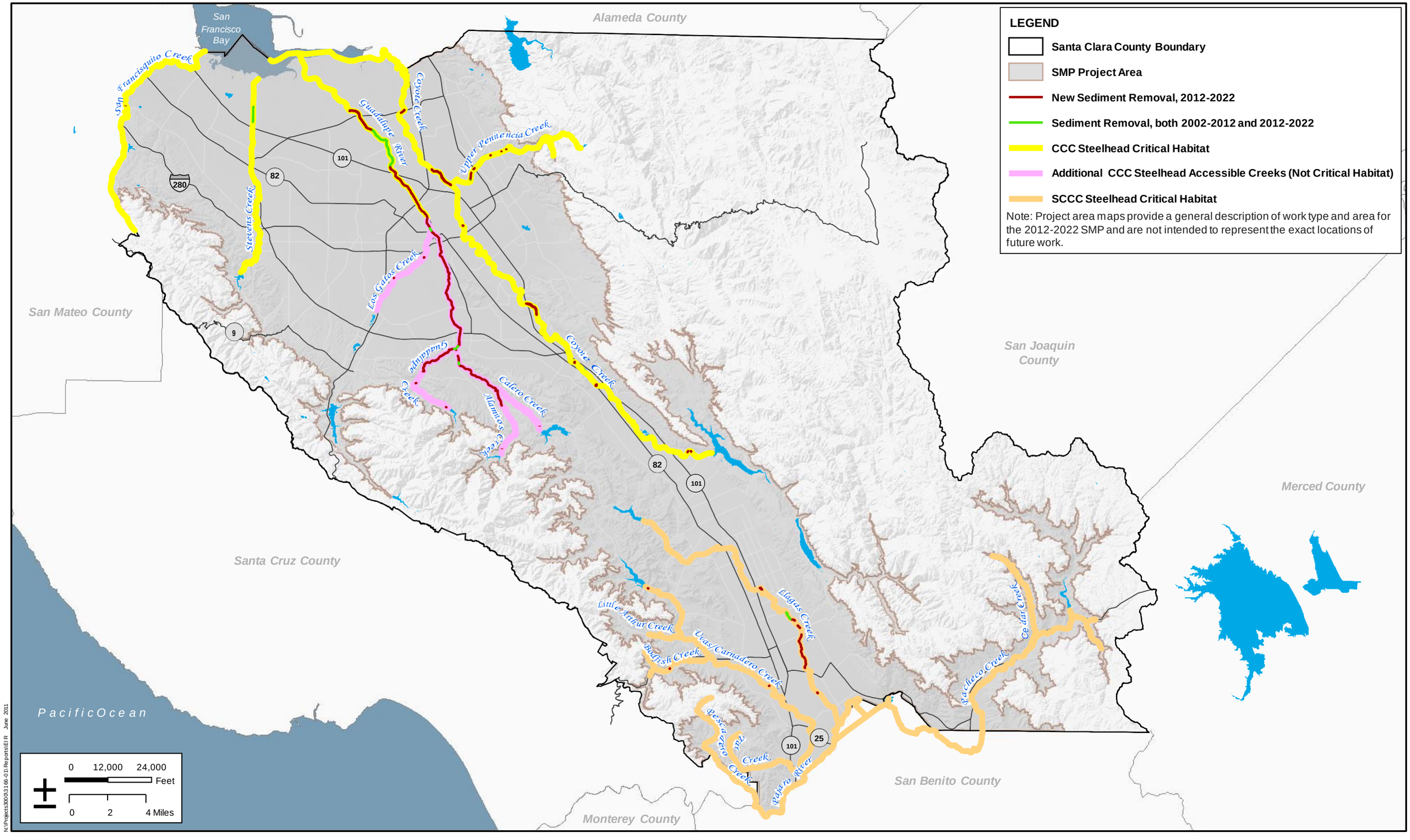

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Figure 3.3-6: Projected Sediment Removal, 2012-2022, along Steelhead Streams

Santa Clara Valley Water District Stream Maintenance Program EIR (3166-01)

July 2011

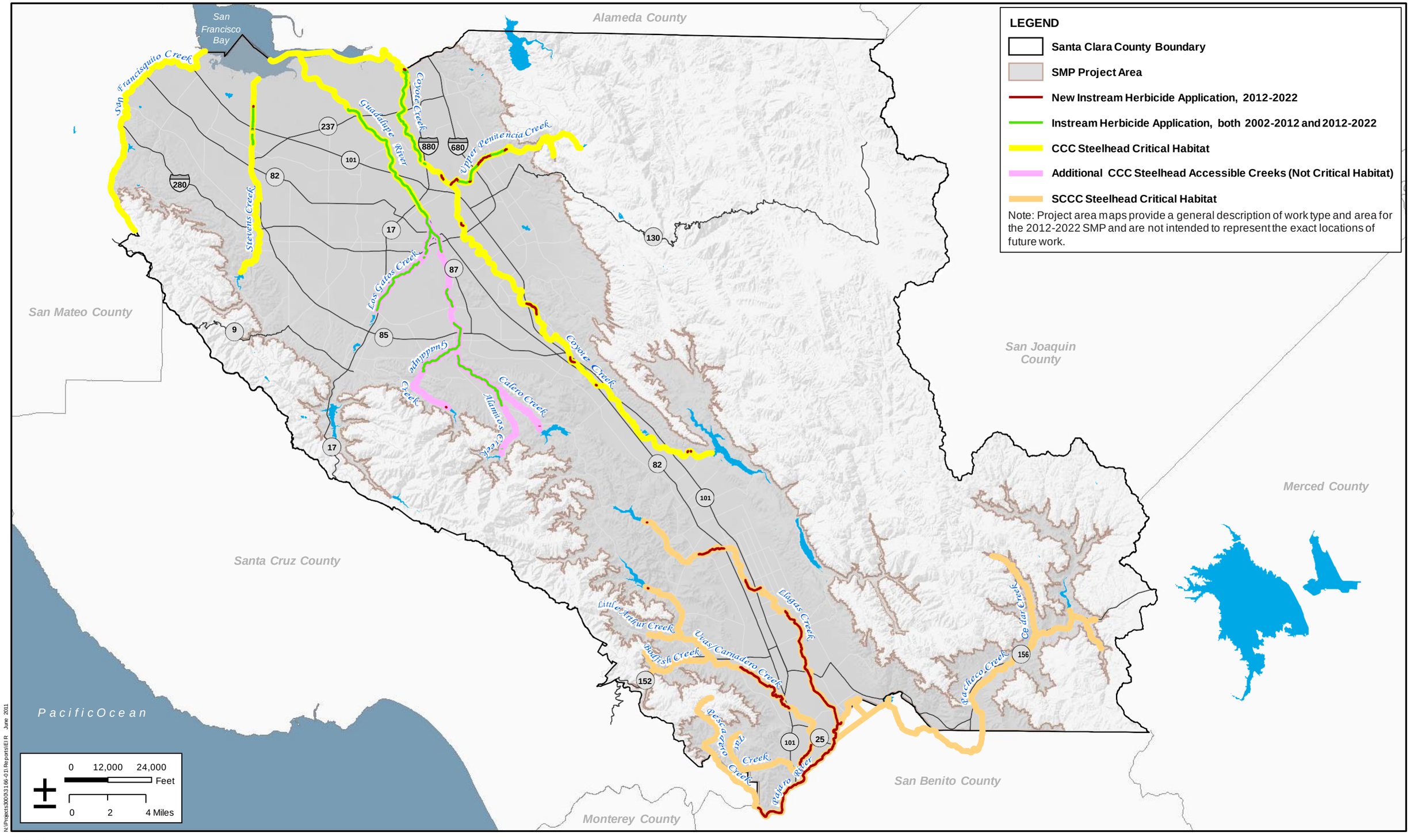

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Figure 3.3-7: Projected Instream Herbicide Application, 2012-2022, along Steelhead Streams

Santa Clara Valley Water District Stream Maintenance Program EIR (3166-01)

July 2011

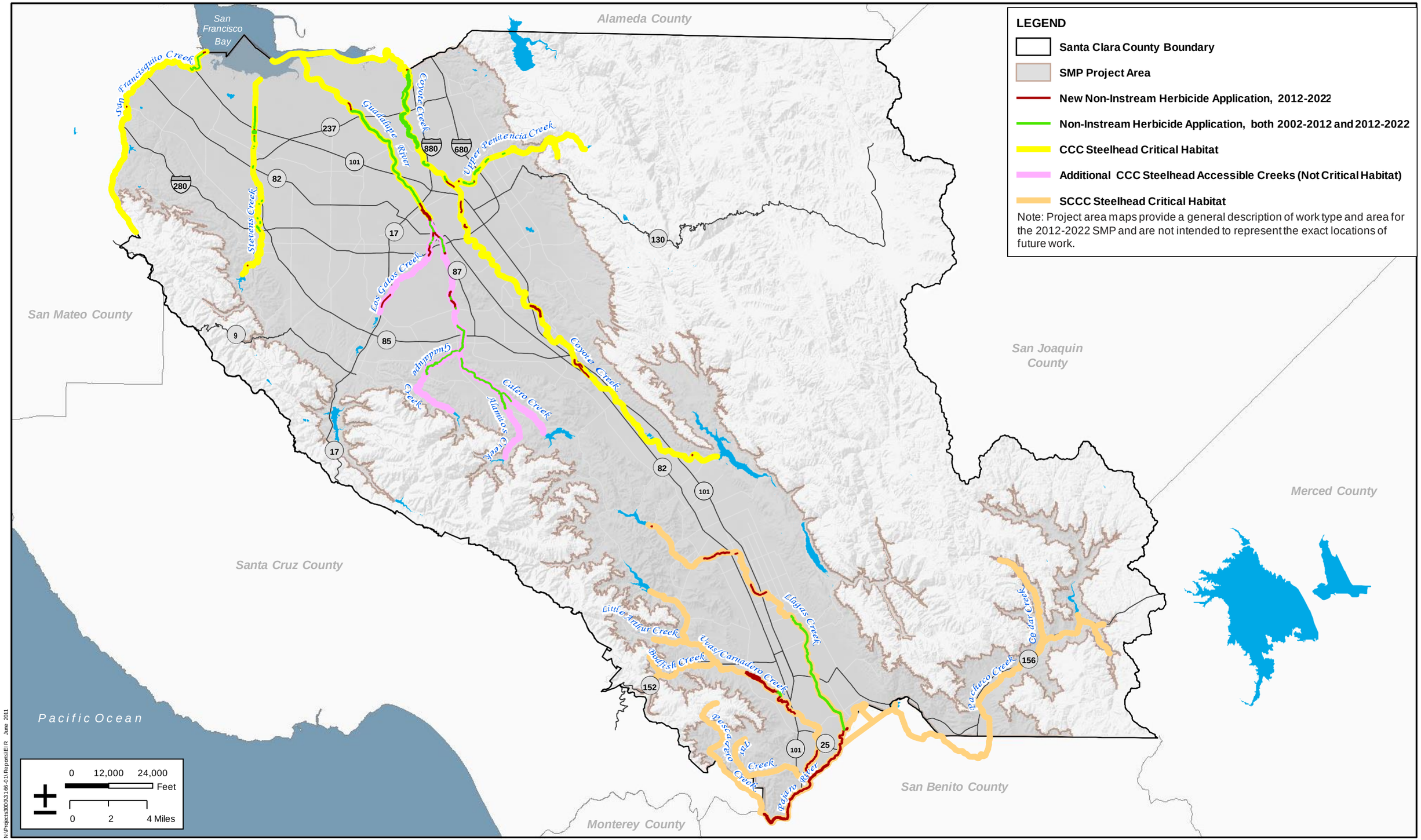

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Figure 3.3-8: Projected Non-Instream Herbicide Application, 2012-2022, along Steelhead Streams

Santa Clara Valley Water District Stream Maintenance Program EIR (3166-01)

July 2011

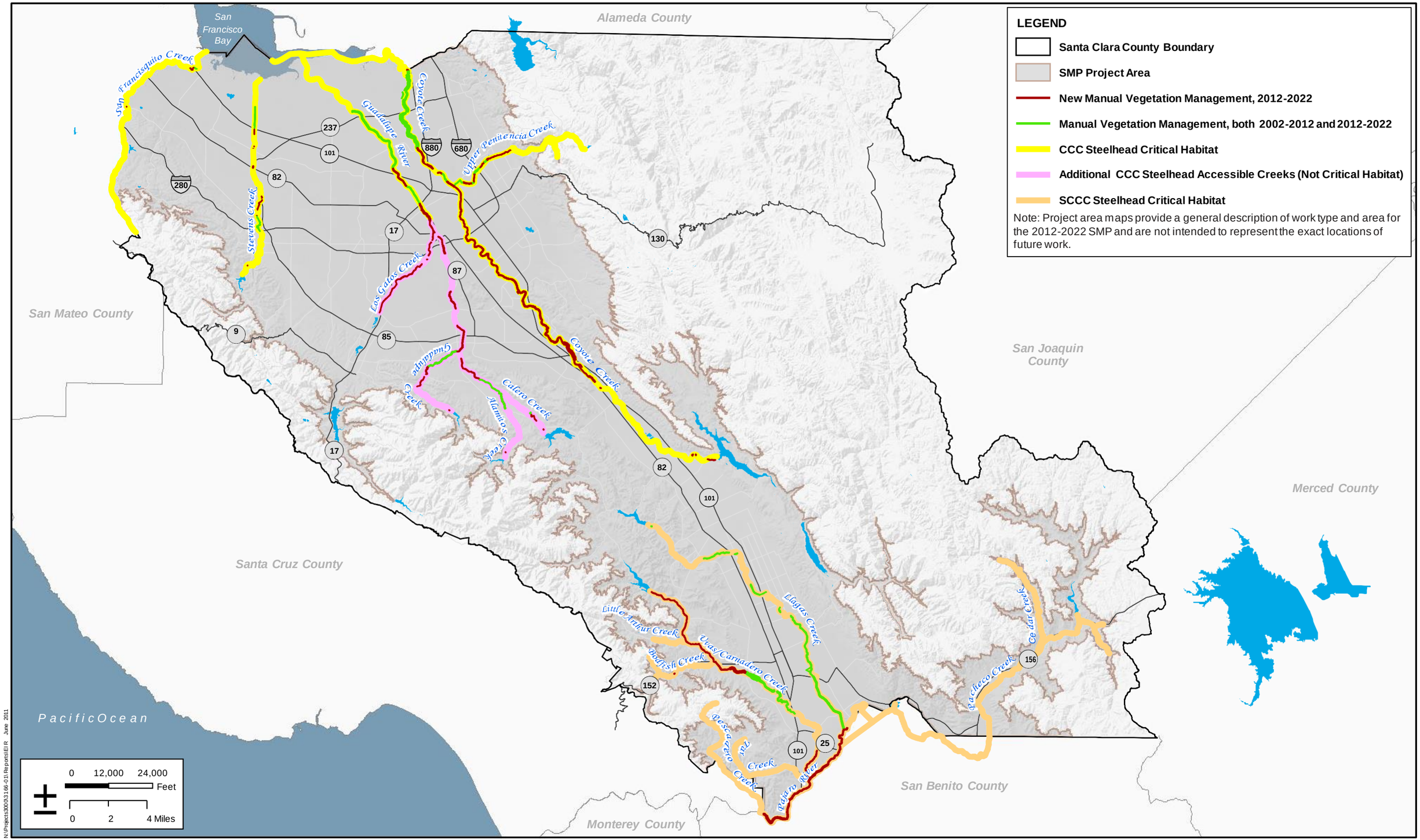

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Figure 3.3-9: Projected Manual Vegetation Management, 2012-2022, along Steelhead Streams

Santa Clara Valley Water District Stream Maintenance Program EIR (3166-01)

July 2011

The Project Area contains designated critical habitat for both the CCC and SCCC steelhead (Figure 3.3-6). Stream maintenance activities would result in both adverse and beneficial effects on designated critical habitat, as described above for steelhead habitat in general. Specifically, Proposed Project activities would impact the primary constituent elements (PCEs) of critical habitat involving freshwater spawning, rearing, and migration habitat for both populations, as well as estuarine habitats of the Central California Coast steelhead.

SCVWD would implement a variety of BMPs to avoid and minimize impacts to steelhead and their habitats. These BMPs are listed below and described in Table 2-12.

Table 3.3-~~11~~12. Projected Instream Herbicide Application Work on Streams Supporting Steelhead, 2012–2022

Creek/River	Work Areas from 2002–2012 Period Also Projected for 2012–2022 (miles)	New Work Areas for 2012–2022 (miles)	Total Work Areas for 2012–2022 (miles)
Central California Coast Steelhead			
Stevens Creek	0.08	<0.01	0.08
Guadalupe River	0.34	0.00	0.34
Los Gatos Creek	0.29	0.00	0.29
Guadalupe Creek	0.12	0.04	0.16
Alamitos Creek	0.24	0.00	0.24
Coyote Creek	0.17	0.19	0.36
Upper Penitencia Creek	0.24	0.18	0.42
Calero Creek	0.00	0.04	0.04
Subtotal	1.48	0.45	1.93
South-Central California Coast Steelhead			
Pajaro River	0.00	0.42	0.42
Uvas/Carnadero Creek	0.00	0.33	0.33
Llagas Creek	0.00	1.80	1.80
Subtotal	0.00	2.55	2.55
Total	1.48	3.00	4.48

Source: Data compiled by Horizon Water and Environment in 2011 based on information from SCVWD

Table 3.3-~~12~~13. Projected Non-Instream Herbicide Application Work on Streams Supporting Steelhead, 2012–2022

Creek/River	Work Areas from 2002–2012 Period Also Projected for 2012–2022 (miles)	New Work Areas for 2012–2022 (miles)	Total Work Areas for 2012–2022 (miles)
Central California Coast Steelhead			
San Francisquito Creek	1.31	0.13	1.43
Stevens Creek	1.44	0.06	1.50
Guadalupe River	8.96	1.99	10.95
Los Gatos Creek	0.01	0.23	0.24
Guadalupe Creek	2.36	0.00	2.36
Alamitos Creek	3.35	0.00	3.35
Coyote Creek	5.42	1.94	7.36
Upper Penitencia Creek	1.49	0.02	1.51
Calero Creek	0.64	0.01	0.65
Subtotal	24.98	4.38	29.35
South-Central California Coast Steelhead			
Pajaro River	0.00	0.17	0.17
Uvas/Carnadero Creek	0.32	1.77	2.09
Llagas Creek	7.14	1.15	8.29
Subtotal	7.46	3.09	10.55
Total	32.44	7.47	39.90

Source: Data compiled by Horizon Water and Environment in 2011 based on information from SCVWD

Table 3.3-~~13~~14. Projected Manual Vegetation Management Work on Streams Supporting Steelhead, 2012–2022

Creek/River	Work Areas from 2002–2012 Period Also Projected for 2012–2022 (miles)	New Work Areas for 2012–2022 (miles)	Total Work Areas for 2012–2022 (miles)
Central California Coast Steelhead			
San Francisquito Creek	0.19	0.04	0.23
Stevens Creek	1.15	0.02	1.17
Guadalupe River	5.30	5.01	10.31
Los Gatos Creek	0.00	1.43	1.43
Guadalupe Creek	1.90	0.89	2.79
Alamitos Creek	1.52	1.72	3.24
Coyote Creek	4.99	3.27	8.26
Upper Penitencia Creek	0.56	0.23	0.79
Calero Creek	0.05	0.07	0.12
Subtotal	15.66	12.68	28.34
South-Central California Coast Steelhead			
Pajaro River	0.00	0.42	0.42
Uvas/Carnadero Creek	2.12	0.27	2.39
Llagas Creek	7.43	0.00	7.43
Bodfish Creek	0.00	0.01	0.01
Subtotal	9.55	0.70	10.25
Total	25.21	13.38	38.59

Source: Data compiled by Horizon Water and Environment in 2011 based on information from SCVWD

Applicable Best Management Practices

BMP GEN-1: In-Channel Work Window
BMP GEN-2: Instream Herbicide Application Work Window
BMP GEN-4: Minimize the Area of Disturbance
BMP GEN-8: Protection of Sensitive Fauna Species from Herbicide Use
BMP GEN-15: Salvage Native Aquatic Vertebrates from Dewatered Channels
BMP GEN-20: Erosion and Sediment Control Measures
BMP GEN-23: Stream Access
BMP GEN-26: Spill Prevention and Response
BMP GEN-30: Vehicle and Equipment Maintenance
BMP GEN-32: Vehicle and Equipment Fueling
BMP GEN-33: Dewatering for Non-Tidal Sites
BMP GEN-34: Dewatering in Tidal Work Areas
BMP GEN-35: Pump/Generator Operations and Maintenance
BMP SED-2: Prevent Scour Downstream of Sediment Removal
BMP SED-3: Restore Channel Features
BMP VEG-1: Minimize Local Erosion Increase from In-Channel Vegetation Removal
BMP VEG-3: Use Appropriate Equipment for Instream Removal
BMP BANK-1: Bank Stabilization Design to Prevent Erosion Downstream
BMP BANK-2: Concrete Use near Waterways

Conclusion

By implementing these BMPs, SCVWD is expected to be able to reduce impacts to steelhead. Nevertheless, the Proposed Project would result in residual impacts to this species and its habitats because complete avoidance could not be accomplished while still meeting the project goals for public health and safety directives. This impact would be significant because of the regional rarity of this species and the importance of Santa Clara County creeks to the species (Significance Criteria A, B, and E). Implementation of Mitigation Measure BIO-8 would reduce this residual impact to a less-than-significant level.

As discussed under Impacts BIO-1 and BIO-2, Mitigation Measure BIO-1 and Mitigation Measure BIO-2 would require SCVWD to provide compensatory mitigation for impacts to wetland, aquatic, and riparian habitats. This mitigation may take a variety of forms, and not all of this mitigation would occur along steelhead streams. However, Mitigation Measure BIO-1 and Mitigation Measure BIO-2 would result in benefits to steelhead through wetland, aquatic, and riparian habitat restoration, enhancement, and protection, which would help to maintain water quality, cover, and instream habitat complexity for steelhead. In addition, Mitigation Measure BIO-8 and Mitigation Measure BIO-9 would be implemented to compensate more specifically for Proposed Project impacts to steelhead. Mitigation Measure BIO-8 and Mitigation Measure BIO-9 would be implemented to reduce the impacts on steelhead to a less-than-significant level.

Mitigation Measure BIO-8: Augmentation of Spawning Gravel

SCVWD will implement gravel augmentation as mitigation for SMP impacts to CCC and SCCC steelhead spawning habitat. If more than ~~500~~ 100 square feet of sediment removal is proposed along steelhead streams, an SCVWD fisheries ecologist will assess the sediment removal site for spawning and rearing habitat quality before the initiation of work. The biologist will determine the extent of sediment that is proposed for removal and that is considered to be "high-quality" spawning gravel, based on the following criteria:

- Less than 25-30 percent fines less than 6.35 mm (Kondolf 2000, Kondolf and Wolman 1993)
- Less than 12-14 percent fines less than 0.85 mm (Kondolf 2000)
- D50 (median particle size) of 12.5 to 22.0 mm, based on D50 of rainbow trout and steelhead from 30 to 65 cm length (Kondolf and Wolman 1993), corresponding to a range of 275 to 640 cm of steelhead adults recovered in streams of the San Francisco estuary (Leidy et al. 2005)
- Minimum patch size greater than 1.1 m^2 (Trush 1991)

The habitat needs to be accessible under typical flows for when the appropriate life stages are present. Suitable depths and velocities must be available during flows typical of spawning season. Factors related to accessibility include depth and velocity criteria, which for spawning, are:

- Depth: 10–150 cm (Moyle 2002)
- Velocity: 20–155 cm/s (Moyle 2002)

If more than ~~500~~ 100 square feet of high-quality gravel will be removed along steelhead streams, compensatory mitigation will be provided by the installation of suitable spawning gravel along the affected creek at a 1:1 (mitigation:impact) ratio on a square footage or acreage basis. Locations where sediment removal is performed at fish ladders will not require gravel augmentation. The mitigation site will be as close to the impacted reach as is feasible, and will be located within a steelhead-accessible reach of the same creek. The site will be selected with input from the fisheries ecologist, taking channel capacity and other SMP-related factors into account. The fisheries ecologist will prepare specifications for the mitigation, including size, type, depth, and configuration of gravel. The mitigation will be implemented within 1 year following the impact.

Mitigation Measure BIO-9: Augmentation of Instream Complexity for Non-Tidal Stream Fish

SCVWD will provide mitigation for loss of instream complexity, which provides habitat heterogeneity, cover, and refugia during high flows, by in-kind installation of structures that provide such complexity. Before sediment removal, bank stabilization, or large woody debris removal activities, the affected area will be surveyed by an SCVWD fisheries ecologist to identify any features that provide high-quality instream complexity for fish. The ecologist will determine that such features are of "high quality" based on ~~a combination~~ the presence of one or more of the following criteria:

- Large woody debris providing cover and refugia from high flow velocities
- Deep pools providing rearing habitat and refugia from high flow velocities
- Cobble/boulder features providing cover, refugia from high flow velocities, and velocities suitable for good invertebrate drift

If such high-quality features must be removed during Proposed Project activities, compensatory mitigation will be provided by the installation of instream complexity features on a 0.~~5~~1:1 (impact:mitigation~~:impact~~) basis, on the basis of either the number of complexity features or the area that is affected hydraulically by the features that are removed; the fisheries ecologist will determine which of these two metrics is appropriate based on the values to fish provided by the impacted features. Thus, one instream complexity feature will be installed for every ~~two~~ one that ~~are~~ is removed, or an instream complexity feature hydraulically affecting roughly ~~half~~ the same area of the feature(s) removed will be installed. ~~This ratio is less than 1:1 under the understanding that erosion, deposition, tree-falls, and debris mobilization within a few years following the removal of instream complexity will naturally reintroduce some complexity to the stream.~~

As examples, enhancing instream complexity may involve:

- enlarging an existing large woody debris feature;
- anchoring a large woody debris feature;
- geomorphically shaping an instream bar or bed feature for improved habitat;
- enhancing a pool feature threatened by sedimentation; or
- enhancing streambed conditions to increase the range of flow velocity and habitat conditions.

Priority for these mitigation activities will be given to SMP sites where instream features cannot be retained during construction because of conflicting objectives. For example, if a channel pool configuration cannot be retained during a bank protection job and the area is devoid of other complex pool features, then this area will be evaluated for the addition of an instream complexity feature.

In addition to enhancing existing features, new instream features may be developed to achieve several habitat objectives, including: increasing pool habitat in homogenized stream reaches, providing escape cover for rearing and spawning fish, deepening feeding areas in riffle habitat, creating a variety of stream flow velocities for cover, sorting gravel, and providing resting areas for upstream migration. Additionally, improving instream function can benefit other aquatic flora and fauna by improving the overall stream complexity for which these species depend on for survival. If effective, such new instream complexity features (particularly in highly modified, urban streams) can augment or replace existing structural features required for successful reproduction and rearing of native fish and amphibians in the freshwater environment.

Newly developed instream habitat improvements may use log structures, boulder structures, or a combination of both log and boulder structures to achieve more complex habitats. Possible configurations of boulders or logs include weirs, clusters, single and

opposing wing deflectors, spider logs, and digger logs. The construction materials selected for each instream complexity feature will depend on the target objective and site conditions.

The selected mitigation site will be as close to the impacted reach as is technically feasible. For instream complexity features that are removed by sediment removal or bank stabilization activities, mitigation will be incorporated into the same reach where complexity was removed to the extent feasible. The site will be selected with input from the fisheries ecologist, taking channel capacity and other SMP-related factors into account. The fisheries ecologist will prepare specifications for the mitigation, including size, type, and configuration of the feature. The mitigation will be implemented within 1 year following the impact. The fisheries ecologist will then inspect the completed complexity feature to assure that it meets the criteria for "high quality" instream complexity listed above.

It is possible that MM BIO-8 and MM BIO-9 may be refined during the Section 7 consultation process with the NMFS (e.g., in the Biological Opinion covering Project effects on steelhead) or by the USACE, CDFG, or RWQCB in permits issued by these agencies, in which case the refinements required by these agencies would be implemented.

MM BIO-8 and BIO-9 together will mitigate impacts to steelhead to less-than-significant levels by enhancing habitat for this species so as to protect its populations, thereby ensuring that the SMP does not substantially reduce the number or restrict the range of this threatened species, have a substantial adverse effect on this special-status species, or impede the use of its nursery sites.

Mitigation activities such as gravel augmentation (Mitigation Measure BIO-8) and installation of instream complexity (Mitigation Measure BIO-9) could result in impacts to aquatic species during installation; however, the net effect of these measures on fish and amphibians would be beneficial.

Impact BIO-9: Impacts on the Pacific Lamprey and Monterey Roach (Significance Criteria A, B, and E; Less than Significant with Mitigation)

The Pacific lamprey is not on any special-status species list. However, this anadromous species likely has been impacted by many of the factors that threaten the steelhead, and it occurs in a number of SCVWD-maintained creeks. Thus, the potential effects of Proposed Project activities on this fish have been assessed. It is currently known to occur in the Project Area in the Guadalupe River and San Francisquito, Coyote, Upper Penitencia, Lower Silver, Guadalupe, Alamitos, Stevens, and Uvas Creeks. The Monterey roach (a California species of special concern) is a small minnow that occurs in the Project Area in streams within the Pajaro River watershed. Specifically, it is known to occur in Llagas and Uvas Creeks, and it likely is present in other Project Area creeks within the Pajaro River Basin.

As described under *Determination of Impacts to Wildlife and Fisheries*, proposed maintenance activities may result in adverse effects to habitat used by both of these fish through dewatering, fish relocation, increased turbidity, changes in habitat structure, effects of heavy equipment use on these species, their prey, and their habitat, and other impact pathways. Permanent habitat impacts to these species' habitats are expected to be

very limited but could potentially occur if bank stabilization activities replaced their habitat with hardscape. Electrofishing for fish relocation, stranding, herbicide and surfactant use, and increased turbidity may result in the direct injury or mortality of individual fish.

The distribution of these fish in the Project Area is not as well known as that of steelhead, and thus no detailed impact estimates are provided. However, Table 3.3-~~10~~11 for steelhead provides an estimate of the potential extent of sediment removal and vegetation management activities along creeks that could support the Pacific lamprey, and Tables 3.3-~~11~~12 through 3.3-~~13~~14 provide an estimate of the potential extent of projected instream herbicide, non-instream herbicide, and manual vegetation management activities, respectively, along creeks that could support the lamprey. Similarly, the projected activities along creeks within the Pajaro Basin, as listed in those tables, provide an estimate of the potential impacts of Proposed Project activities along creeks that could support the Monterey Roach.

When performing any type of maintenance activity that would necessitate work within or adjacent to the active channel, SCVWD would implement BMPs to reduce impacts to water quality (e.g., erosion and sediment control, spill prevention, standard herbicide requirements). In addition, implementation of BMPs related to dewatering of work sites would assure that, before dewatering, the best means to bypass flow through a work site would be determined, to minimize disturbance to the channel and avoid direct mortality of fish. Sediment removal BMPs would assure that low-flow channels within non-tidal streams were returned as closely as possible to their original location and configured with the appropriate depth for fish passage. These BMPs are as follows, and a description of each is provided in Table 2-12.

Applicable Best Management Practices

BMP GEN-1: In-Channel Work Window
BMP GEN-2: Instream Herbicide Application Work Window
BMP GEN-4: Minimize the Area of Disturbance
BMP GEN-8: Protection of Sensitive Fauna Species from Herbicide Use
BMP GEN-15: Salvage Native Aquatic Vertebrates from Dewatered Channels
BMP GEN-20: Erosion and Sediment Control Measures
BMP GEN-23: Stream Access
BMP GEN-26: Spill Prevention and Response
BMP GEN-30: Vehicle and Equipment Maintenance
BMP GEN-32: Vehicle and Equipment Fueling
BMP GEN-33: Dewatering for Non-Tidal Sites
BMP GEN-34: Dewatering in Tidal Work Areas
BMP GEN-35: Pump/Generator Operations and Maintenance
BMP SED-2: Prevent Scour Downstream of Sediment Removal
BMP SED-3: Restore Channel Features
BMP VEG-1: Minimize Local Erosion Increase from In-Channel Vegetation Removal
BMP VEG-3: Use Appropriate Equipment for Instream Removal
BMP BANK-1: Bank Stabilization Design to Prevent Erosion Downstream
BMP BANK-2: Concrete Use near Waterways

Conclusion

Implementation of BMPs would reduce impacts on the Pacific lamprey and Monterey roach and their habitats. However, because of the factors potentially threatening these species' populations and the relatively limited ranges of both species, impacts to individuals and their habitats resulting from the Proposed Project would be significant (Significance Criteria A, B, and E).

As discussed under Impacts BIO-1 and BIO-2, Mitigation Measure BIO-1 and Mitigation Measure BIO-2 would require SCVWD to provide compensatory mitigation for impacts to wetland, aquatic, and riparian habitats. This mitigation may take a variety of forms, and not all of this mitigation would occur along streams that supported the Pacific lamprey and Monterey roach. However, Mitigation Measure BIO-1 and Mitigation Measure BIO-2 would result in benefits to these species through wetland, aquatic, and riparian habitat restoration, enhancement, and protection, which would help to maintain water quality, cover, and instream habitat complexity for these species. In addition, implementation of Mitigation Measure BIO-9 would increase instream complexity, and thus could be expected to benefit the Pacific lamprey and Monterey roach in a manner similar to that described for steelhead. Mitigation Measure BIO-1, Mitigation Measure BIO-2, and Mitigation Measure BIO-9 would be implemented to reduce the impact to the Pacific lamprey and Monterey roach to a less-than-significant level by compensating for Proposed Project impacts to habitat and individuals.

Impact BIO-10: Impacts on the Longfin Smelt and Green Sturgeon (Significance Criteria A and B; Less than Significant with Mitigation)

Longfin smelt (state listed as threatened) is known to occur, and green sturgeon (federally listed as threatened and a California species of special concern) could potentially occur, in the tidal reaches of South Bay sloughs. If these species were to occur in reaches near proposed maintenance activities, the health of individuals could be impaired by decreased water quality (e.g., increased turbidity resulting from sediment removal in lower reaches of creeks or spills of fuels or chemicals) . Habitat of these species would be affected little by Proposed Project activities, but removal of vegetation along sloughs could potentially result in minor adverse effects on these species.

The only sediment removal activities projected within tidal waters where southern green sturgeon could potentially occur would take place along uppermost Alviso Slough, from the Union Pacific Railroad tracks just below Gold Street upstream to the upper limits of tidal waters near Tasman Drive (a distance of approximately 1.4 miles). Within this 1.4-mile reach, sediment would be removed from approximately 40 percent of the reach at a time, and sediment removal would occur approximately five times during the 10-year Proposed Project period. Vegetation management is projected along approximately 6.89 miles of sloughs, including 3.59 miles where vegetation management also was projected for 2002–2012, and 3.30 miles where new work is projected.

These species occur infrequently and in low numbers, if at all, in the immediate Project Area, and they are not expected to spawn in the Project Area. Furthermore, they would be unlikely to occur upstream from tidal reaches because of a lack of suitable spawning conditions. Because of the infrequency of these species' occurrence in the Project Area, the

very limited extent of Proposed Project activities in tidal habitats, and the fact that instream activities that could result in adverse water quality effects would not extend far downstream in tidal sloughs (i.e., to areas where these species were more likely to occur), a low probability would exist that proposed maintenance activities would result in substantial effects on the health or survival of any individuals or have a substantial adverse effect on these species' habitats. Nevertheless, the Proposed Project would affect tidal habitat, which is designated critical habitat for the green sturgeon, as described generally for sturgeon habitat above. Specifically, Proposed Project activities could affect the PCEs of critical habitat involving food resources, water quality, and sediment quality for the green sturgeon.

SCVWD would implement BMPs for all activities along sloughs in which the longfin smelt and green sturgeon could potentially occur. These BMPs are as follows, and a description of each is provided in Table 2-12.

Applicable Best Management Practices

BMP GEN-1: In-Channel Work Window
BMP GEN-2: Instream Herbicide Application Work Window
BMP GEN-4: Minimize the Area of Disturbance
BMP GEN-8: Protection of Sensitive Fauna Species from Herbicide Use
BMP GEN-20: Erosion and Sediment Control Measures
BMP GEN-23: Stream Access
BMP GEN-26: Spill Prevention and Response
BMP GEN-30: Vehicle and Equipment Maintenance
BMP GEN-32: Vehicle and Equipment Fueling
BMP GEN-34: Dewatering in Tidal Work Areas
BMP GEN-35: Pump/Generator Operations and Maintenance
BMP SED-2: Prevent Scour Downstream of Sediment Removal
BMP SED-3: Restore Channel Features
BMP VEG-1: Minimize Local Erosion Increase from In-Channel Vegetation Removal
BMP VEG-3: Use Appropriate Equipment for Instream Removal
BMP BANK-1: Bank Stabilization Design to Prevent Erosion Downstream
BMP BANK-2: Concrete Use near Waterways

Conclusion

Implementation of BMPs would reduce impacts on the longfin smelt and green sturgeon and their habitats. Because of the expected infrequency of these species' occurrence in the Project Area and likely low abundance when they occurred, the BMPs likely would be adequate to reduce impacts to these species to very low levels. However, because the longfin smelt has been recorded in tidal sloughs in the Proposed Project vicinity, and because relatively little is known about how these species use South Bay sloughs, some potential would exist for Proposed Project activities to result in significant impacts (Significance Criteria A and B).

As discussed under Impact BIO-1, Mitigation Measure BIO-1 includes mitigation for impacts to tidal wetlands and other waters, which would be the habitats in which the longfin smelt and green sturgeon could potentially occur. SCVWD would use the 21 acres of ~~excess~~ tidal marsh restoration that it has accomplished at the Island Ponds as available

mitigation for impacts to tidal wetlands and aquatic habitats, as well as tidal species such as the longfin smelt and green sturgeon. This mitigation would include tidal channels that could be used by green sturgeon and that already have been demonstrated to be used by longfin smelt (Hobbs 2011). Therefore, Mitigation Measure BIO-1 would be implemented to reduce the impacts on the longfin smelt and green sturgeon to a less-than-significant level, assuring that the SMP Update would not substantially reduce the number or restrict the range of these threatened species, have a substantial adverse effect on these special-status species, or in the case of the longfin smelt, impede the use of its nursery sites. It is possible that this mitigation may be refined by the NMFS, which regulates impacts to the southern green sturgeon, during Section 7 consultation (e.g., in a Biological Opinion) and/or CDFG, which regulates impacts to the longfin smelt, during Section 2081 consultation (e.g., in an Incidental Take Permit), in which case these refined measures would be implemented.

Impact BIO-11: Impacts on the California Tiger Salamander (Significance Criteria A, B, and E; Less than Significant with Mitigation)

The California tiger salamander (federally and state-listed as threatened ~~and state listed as endangered~~) has been largely extirpated from the valley floor, and extant populations in the Project Area are now limited primarily to areas with seasonal pools and stock ponds around the periphery of the Project Area, particularly in the less heavily developed areas and areas that have not been heavily cultivated. Because of its distribution in the Project Area, potential impacts to California tiger salamanders would be relatively limited. However, they may pass through work sites during seasonal movements to and from breeding ponds and may use upland burrows within work sites as refugia (e.g., to prevent dehydration during the dry summer and autumn months). In addition, some potential would exist for California tiger salamanders to breed in portions of canals, particularly inoperable canals such as the Coyote and Coyote Extension Canals.

As described under *Determination of Impacts to Wildlife and Fisheries*, proposed maintenance activities may affect California tiger salamander foraging or dispersal habitat and/or individuals (e.g., during maintenance activities or from increased mortality after construction). For example, maintenance activities may result in the injury or mortality of individuals as a result of worker foot traffic, equipment use, or vehicle traffic. Daily and seasonal movements throughout individuals' home ranges may be temporarily affected during maintenance activities because of disturbance, and substrate vibrations may cause individuals to move out of refugia, exposing them to a greater risk of predation or desiccation. In addition, tiger salamanders may be crushed in their burrows by the passage of heavy equipment or trapped and suffocated, and petrochemicals, hydraulic fluids, and solvents that are spilled or leaked from construction vehicles or equipment may kill individuals.

Removal of burrows in levees, a component of the management of animal conflicts, could impact California tiger salamanders because of the potential for tiger salamanders to use burrows as refugia. Direct mortality of individuals may occur because of filling or compaction of crevices/holes on levee surfaces or slopes. In addition, the loss of subterranean habitat caused by filling of burrows and the use of surface barriers to burrowing animals would reduce the availability of refugia, potentially subjecting dispersing salamanders to increased predation or desiccation if they were unable to find

suitable refugia. Loss of subterranean habitat also may result in the displacement of invertebrates that serve as a food source for this species. Control of burrowing mammal populations would reduce the availability of upland refugia for the salamander. The extent of effects to California tiger salamander habitat resulting from management of animal conflict activities is difficult to quantify because the extent of and specific locations for animal conflicts management are not generally known. More than 9 miles of levees along canals occur in areas where the California tiger salamander is considered extant and where animal conflict management may occur. In addition, animal conflict management could occur in other non-projected locations within potential California tiger salamander habitat.

By implementing BMPs GEN-12 and GEN-15, tiger salamanders would be relocated from work sites before the onset of maintenance activities that potentially could threaten individuals. Individuals that were found during pre-activity surveys and relocated to suitable habitat outside of the work site may be subjected to physiological stress and face a greater risk of predation, or may undergo increased competition with salamanders already present in the area to which they were relocated.

The vast majority of proposed sediment removal activities would be in areas where California tiger salamanders do not currently occur. Figure 3.3-10 depicts all projected activities relative to the expected distribution of this species in the Project Area, based on known occurrences (primarily from CNDDB 2011) and habitat suitability. As shown in this figure,, this species is largely absent from the portions of the Santa Clara Valley floor that have been heavily impacted by urban development and agricultural activities. Because most projected activities would occur in these valley-floor areas, impacts to areas that could potentially support this species would be very limited.

Because sediment removal is a projected activity for the SMP, the potential locations where sediment removal could impact tiger salamanders can be predicted. These locations are depicted in Figure 3.3-11 and summarized in Table 3.3-~~14~~15. For clarity, Figure 3.3-11 only shows the projected sediment removal activities within areas where the California tiger salamander is expected to be extant. Because no sediment removal activities in predicted California tiger salamander habitat occurred (or will occur) from 2002–2012, all impacts to California tiger salamanders from 2012–2022 would be new activities.

Sediment removal is projected in habitat where the California tiger salamander is expected to be extant, primarily along the urban fringe, along approximately 1.03 miles of creek. The sediment removal projections listed in Table 3.3-~~14~~15 provide only a rough estimate of potential impacts that would result from sediment removal, for several reasons. First, Table 3.3-~~14~~15 depicts the linear miles of channels that would be subject to impacts rather than the acreage of sediment removal itself, under the assumption that impacts to tiger salamanders would be most likely to occur because of movement of heavy equipment along channels rather than excavation of sediments within the channel. In addition, although the species has been recorded in or adjacent to some of the creeks in these areas (e.g., Saratoga Creek, Guadalupe Creek, Coyote Creek, Dexter Canyon Creek), no occurrence records are located within the immediate impact areas. Tiger salamanders are not expected to breed in these stream habitats (with the possible exception of some segments of canals; Coyote Alamitos and Almaden Calero Canals are the only canals where sediment removal is projected within the current distribution of the species). Rather, they are expected to occur here only during seasonal movements to and from breeding ponds, or

possibly while using upland refugia along these streams. Finally, any tiger salamanders present within areas affected by sediment removal activities would be likely to be underground during the dry season and during daylight hours, when such activities would occur, thus reducing the potential for impact. With implementation of the BMPs listed later in this section, particularly BMP GEN-12 (Protection of Special-Status Amphibian and Reptile Species), short-term effects on California tiger salamanders as a result of sediment removal activities are expected to be minimal.

Because vegetation management is a projected activity for the SMP Update, the potential locations where vegetation management could impact tiger salamanders also can be predicted. These locations are depicted in Figure 3.3-12 and summarized in Table 3.3-~~15~~16 (as the linear miles of channel within potential California tiger salamander habitat where vegetation management activities are projected). Although the California tiger salamander has been recorded in or adjacent to some of the creeks listed above, no occurrence records are located within the immediate impact areas, and tiger salamanders are not expected to breed in these stream habitats. Rather, they are expected to occur here only during seasonal movements to and from breeding ponds, or possibly while using upland refugia along these streams. Additionally, any tiger salamanders present within areas affected by vegetation management activities are likely to be underground during the dry season, when many such activities would occur, and during daylight hours, when all vegetation management would take place, thus reducing the potential for impact.

Vegetation management activities would include the application of aquatic herbicide (instream) and herbicide application to terrestrial areas (outside the water), as discussed above. Because California tiger salamanders are not expected to breed in the channels in the work sites and spend little time above ground in upland habitat, herbicide application likely would have limited effects on the survival, reproduction, or growth of California tiger salamanders that may be present in areas where herbicides were applied. Rather, the potential for effects on tiger salamanders resulting from vegetation management would pertain primarily to the physical presence of people and equipment during vegetation management activities. Nevertheless, some potential would exist for salamanders to be exposed to herbicides and surfactants during migration or feeding on the ground's surface, and herbicides also would reduce vegetative cover for salamanders while these animals were moving aboveground.

Critical habitat has been designated for the California tiger salamander (Figure 3.3-9). Projected activities would have the potential to affect designated critical habitat for the species in ways described above and under *Determination of Impacts to Wildlife and Fisheries*. Specifically, Proposed Project activities could affect the PCEs of critical habitat involving upland habitats with subterranean refugia and upland dispersal habitat for the tiger salamander, as described generally for habitat impacts above. However, adverse effects of Proposed Project activities on tiger salamander critical habitat would be limited to approximately 4.55 acres of work sites near the Almaden Calero Canal.

Table 3.3-~~14~~15. Projected Sediment Removal Impacts in Areas of Potential California Tiger Salamander Occurrence, 2012–2022

Creek/River	Sediment Removal Impacts, 2012–2022 (miles)
Alamitos Creek	0.04
Almaden-Calero Canal	0.63
Bodfish Creek	0.01
Calero Creek	0.04
Coyote Alamitos Canal	0.01
Coyote Creek	0.14
Guadalupe Creek	0.08
Llagas Creek	0.04
Los Gatos Creek	0.02
San Francisquito Creek	0.01
Stevens Creek	0.01
Uvas-Carnadero Creek	0.00
Total	**1.03**

Source: Data compiled by Horizon Water and Environment in 2011 based on information from SCVWD

Table 3.3-~~15~~16. Projected Vegetation Management Impacts in Areas of Potential California Tiger Salamander Occurrence, 2012–2022

Creek/River	Vegetation Management Impacts, 2012–2022 only (ac)	Vegetation Management Impacts, 2002–2010 and 2012–2022 (ac)	Total Vegetation Management Impacts, 2012–2022 (ac)
Instream Herbicide Application			
Adobe Creek		0.03	0.03
Alamitos Creek	0.04		0.04
Almaden-Calero Canal		0.32	0.32
Calero Creek	0.05		0.05
Coyote Alamitos Canal		0.06	0.06
Coyote Canal		0.48	0.48
Coyote Canal Extension		0.52	0.52
Coyote Creek	0.48		0.48
Edmundson Creek	0.00		0.00

Table 3.3-~~15~~16. Projected Vegetation Management Impacts in Areas of Potential California Tiger Salamander Occurrence, 2012–2022

Creek/River	Vegetation Management Impacts, 2012–2022 only (ac)	Vegetation Management Impacts, 2002–2010 and 2012–2022 (ac)	Total Vegetation Management Impacts, 2012–2022 (ac)
Guadalupe Creek	0.09		0.09
Llagas Creek	0.01		0.01
Los Gatos Creek	0.03		0.03
Pajaro River	0.48		0.48
Uvas-Carnadero Creek	0.09		0.09
Total	**1.27**	**1.41**	**2.68**
Non-Instream Herbicide Application			
Adobe Creek		0.00	0.00
Almaden-Calero Canal		4.95	4.95
Coyote Alamitos Canal		0.66	0.66
Coyote Canal		1.05	1.05
Coyote Creek	0.09		0.09
Edmundson Creek	0.00	0.03	0.03
Lions Creek		0.28	0.28
Llagas Creek	0.02		0.02
Norwood Creek	0.05		0.05
Pajaro River	1.04		1.04
San Francisquito Creek	0.12		0.12
Santa Teresa Creek	0.03	0.00	0.03
Stevens Creek	0.04		0.04
Uvas-Carnadero Creek	0.17		0.17
Total	**1.56**	**6.97**	**8.53**
Manual Vegetation Management			
Alamitos Creek	0.19		0.19
Almaden-Calero Canal	6.92		6.92
Bodfish Creek	0.16		0.16
Calero Creek	1.98		1.98
Coyote Alamitos Canal		1.28	1.28
Coyote Creek	2.55		2.55
Edmundson Creek	0.02	0.00	0.03
Guadalupe Creek	0.71		0.71

Table 3.3-~~15~~16. Projected Vegetation Management Impacts in Areas of Potential California Tiger Salamander Occurrence, 2012–2022

Creek/River	Vegetation Management Impacts, 2012–2022 only (ac)	Vegetation Management Impacts, 2002–2010 and 2012–2022 (ac)	Total Vegetation Management Impacts, 2012–2022 (ac)
Lions Creek	0.28	0.00	0.29
Llagas Creek	0.20	0.00	0.21
Los Gatos Creek	0.05		0.05
Norwood Creek	0.04		0.04
Pajaro River	1.52		1.52
San Francisquito Creek	0.01		0.01
Santa Teresa Creek	1.09	0.07	1.16
South East Santa Teresa Creek	2.53		2.53
Stevens Creek	0.00		0.00
Uvas-Carnadero Creek	1.94	0.50	2.44
West Little Llagas Creek	0.58		0.58
TOTAL	**20.77**	**1.85**	**22.65**

Source: Data compiled by Horizon Water and Environment in 2011 based on information from SCVWD

SCVWD would implement the following BMPs to reduce impacts to individual California tiger salamanders and their habitats (a description of each is provided in Table 2-12).

Applicable Best Management Practices

BMP GEN-2: Instream Herbicide Application Work Window
BMP GEN-4: Minimize the Area of Disturbance
BMP GEN-8: Protection of Sensitive Fauna Species from Herbicide Use
BMP GEN-12: Protection of Special-Status Amphibian and Reptile Species
BMP GEN-15: Salvage Native Aquatic Vertebrates from Dewatered Channels
BMP GEN-20: Erosion and Sediment Control Measures
BMP GEN-23: Stream Access
BMP GEN-26: Spill Prevention and Response
BMP GEN-30: Vehicle and Equipment Maintenance
BMP GEN-32: Vehicle and Equipment Fueling
BMP GEN-33: Dewatering for Non-Tidal Sites
BMP GEN-35: Pump/Generator Operations and Maintenance
BMP SED-2: Prevent Scour Downstream of Sediment Removal
BMP VEG-1: Minimize Local Erosion Increase from In-Channel Vegetation Removal
BMP VEG-3: Use Appropriate Equipment for Instream Removal
BMP BANK-1: Bank Stabilization Design to Prevent Erosion Downstream
BMP BANK-2: Concrete Use near Waterways
BMP ANI-1: Avoid Redistribution of Rodenticides

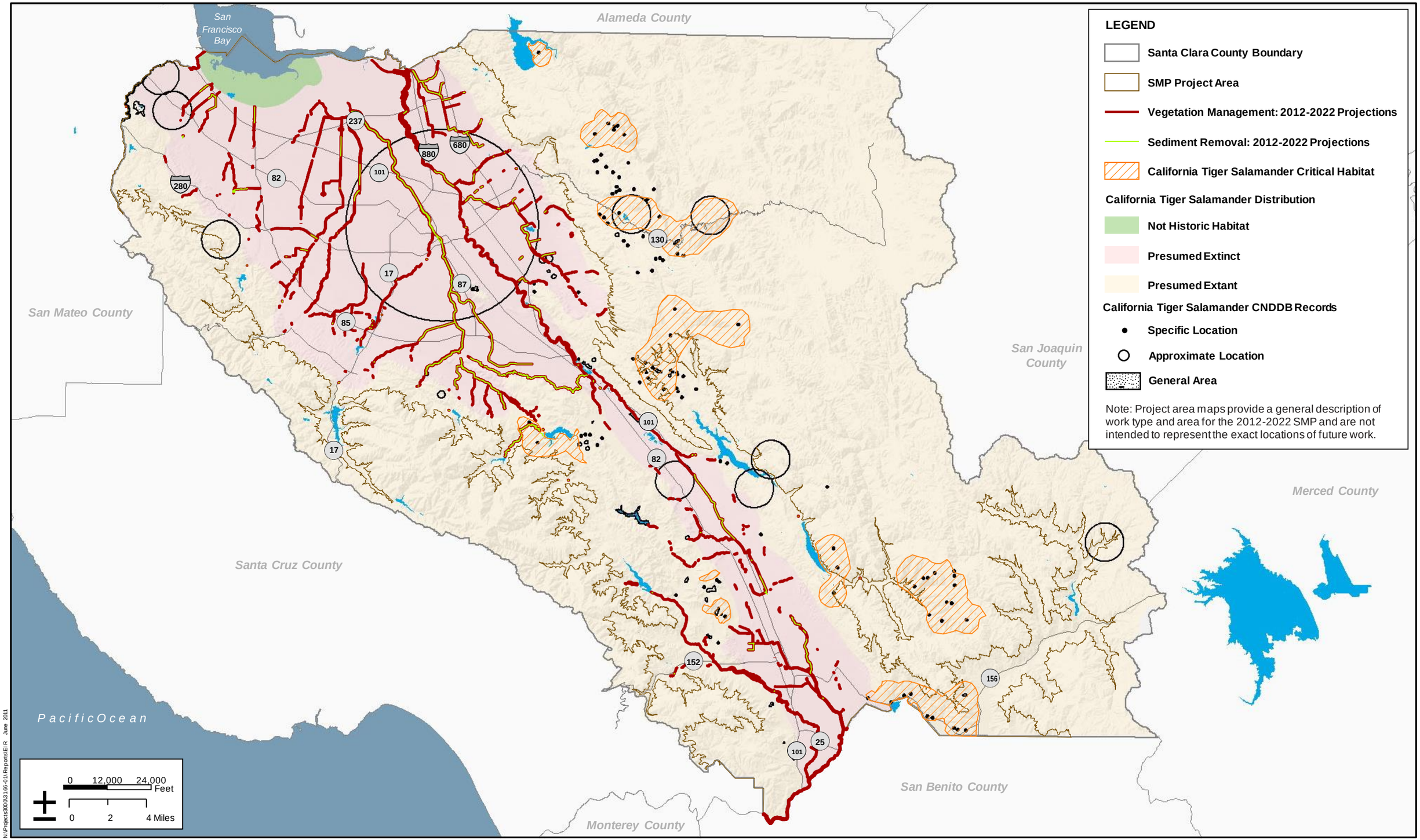

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Figure 3.3-10: Known Occurrences and Expected Distribution of the California Tiger Salamander

Santa Clara Valley Water District Stream Maintenance Program EIR (3166-01)

July 2011

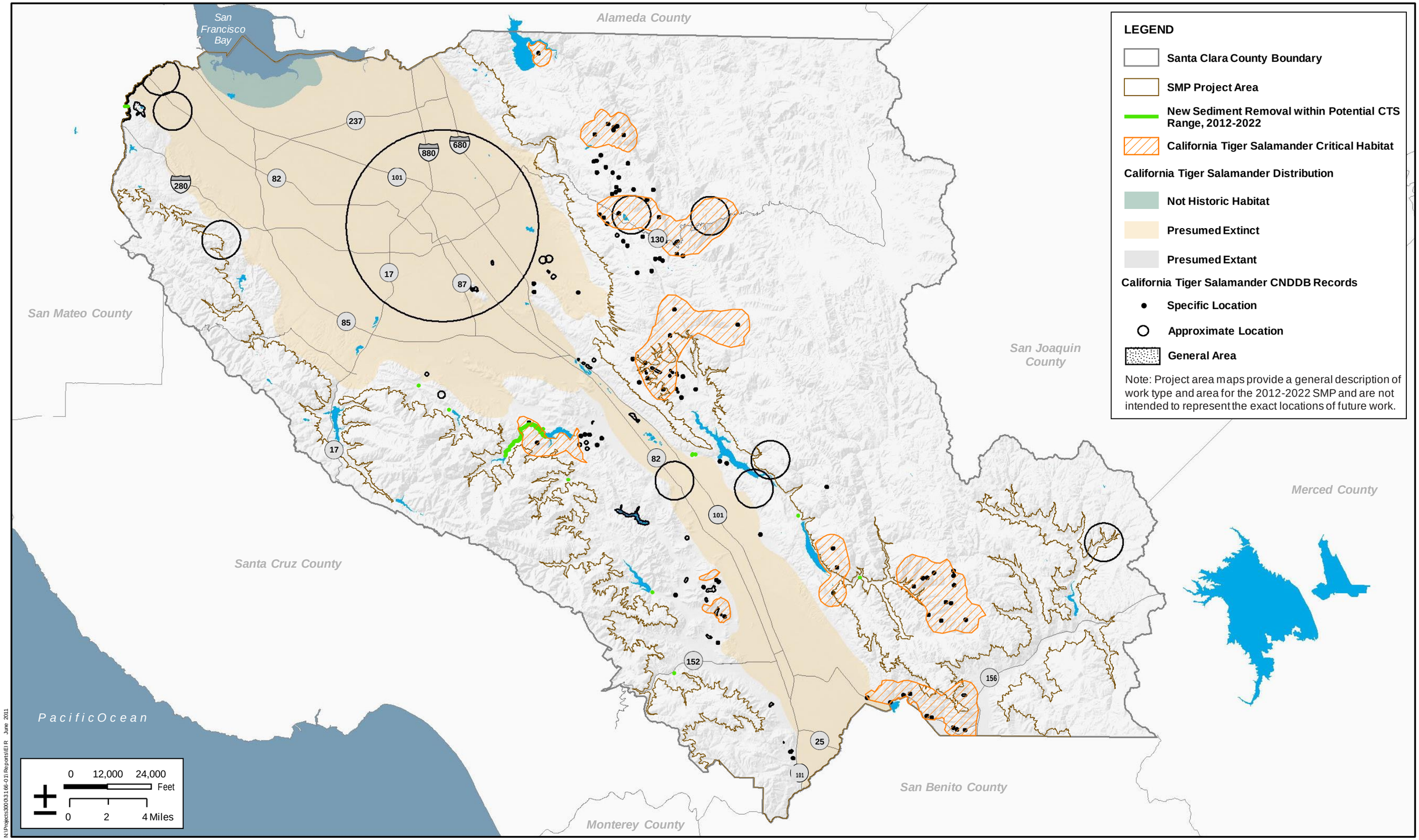

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Figure 3.3-11: Projected Sediment Removal in Areas of Potential California Tiger Salamander Occurrence, 2012-2022

Santa Clara Valley Water District Stream Maintenance Program EIR (3166-01)

July 2011

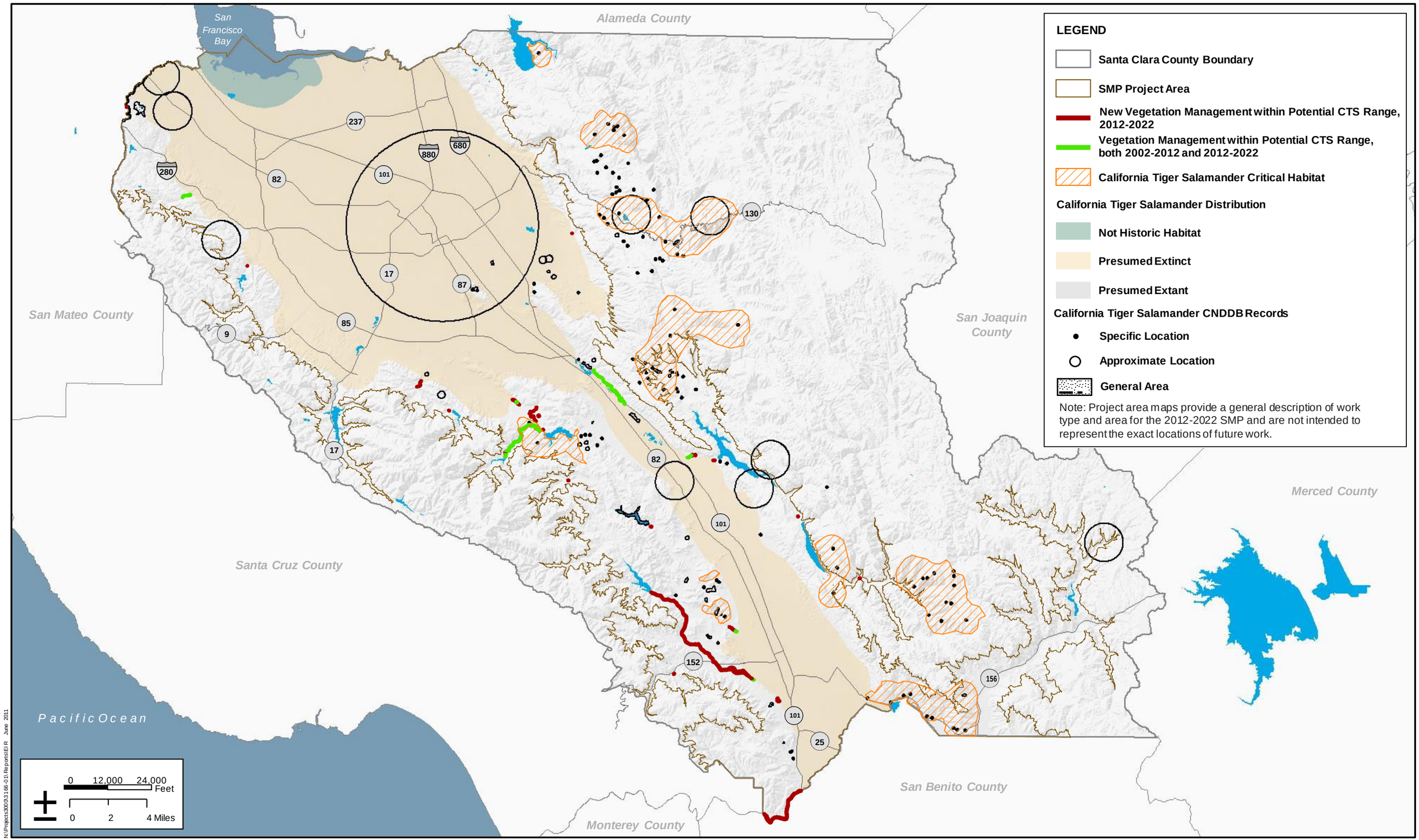

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Figure 3.3-12: Projected Vegetation Management in Areas of Potential California Tiger Salamander Occurrence, 2012-2022

Santa Clara Valley Water District Stream Maintenance Program EIR (3166-01)

July 2011

BMP ANI-4: Animal Control in Sensitive Amphibian Habitat

Conclusion

Although BMPs would reduce the magnitude and extent of Proposed Project impacts on the California tiger salamander, residual impacts would remain because repeated impacts to habitat as well as loss of habitat via burrow removal could not be avoided. Because of the regional rarity of this species, impacts to California tiger salamander and its habitat would be significant (Significance Criteria A, B, and E). Implementation of Mitigation Measure BIO-10 would reduce the impact to California tiger salamander and its habitat to a less-than-significant level.

As discussed under Impacts BIO-1 and BIO-2, Mitigation Measure BIO-1 and Mitigation Measure BIO-2 would require SCVWD to provide compensatory mitigation for impacts to wetland, aquatic, and riparian habitats. This mitigation may take a variety of forms, and not all of this mitigation would occur in areas where California tiger salamander occurred. However, Mitigation Measure BIO-1 and Mitigation Measure BIO-2 could result in benefits to California tiger salamander through wetland restoration and the protection and management of mitigation lands that may support this species. Nevertheless, Mitigation Measure BIO-10 would be implemented to reduce the impact to California tiger salamander and its habitat to a less-than-significant level.

Mitigation Measure BIO-10: Implement Compensatory Mitigation for the California Tiger Salamander

SCVWD will provide mitigation to compensate for unavoidable impacts to California tiger salamanders and their habitat. SCVWD would refine the quantification of impacts to California tiger salamander habitat on an annual basis. At the end of each year's maintenance period, SCVWD will determine the extent of impacts to lands that are both within the potential range of the California tiger salamander and within potentially suitable habitat for the species. To determine whether the SMP impacts are within the potential range of the species, SCVWD will rely on the mapping in Figure 3.3-10 (which may be as modified over the course of 2012–2022, based on any new information that may modify the understanding of the species' potential range in the Project Area). To determine habitat suitability, an SCVWD biologist will determine whether the impact areas support land uses that are not conducive to California tiger salamander use, such as developed lands; all other land uses will be considered potential California tiger salamander habitat.

Compensation for these effects will be provided via the protection, enhancement, and management of habitat that currently supports, or can support, this species at a 2:1 (mitigation:impact~~:mitigation~~) ratio, on an acreage basis. Compensatory mitigation may be carried out through one or both of the following methods, in order of preference:

- The preservation, management, and enhancement (e.g., through long-term management targeted toward this species) of high-quality habitat that is already occupied by California tiger salamanders
- The restoration or enhancement of degraded habitat or habitat that is unsuitable for use by California tiger salamanders, but that (a) is in close proximity to areas of known occurrence and (b) can be made more suitable

for use via construction of one or more breeding ponds or management to improve the quality and availability of burrows in upland habitat

Because most, if not all, impacts to California tiger salamander habitat will consist of modification of upland refugial/dispersal habitat (rather than aquatic breeding habitat), mitigation lands will also consist of upland habitat for this species. All mitigation lands for this species must be located within Santa Clara County and within the area where the species is thought to be extant as shown in Figure 3.3-10 (or as otherwise modified over the course of 2012–2022, based on any new information that may modify the understanding of the species' potential range in the Project Area). SCVWD will develop an HMMP describing the measures that will be taken to manage the property and to monitor the effects of management on the California tiger salamander. That plan will include, at a minimum, the following:

- a summary of impacts to California tiger salamander habitat and populations, and the proposed mitigation;
- a description of the location and boundaries of the mitigation site and description of existing site conditions;
- a description of measures to be undertaken if necessary to enhance (e.g., through focused management) the mitigation site for California tiger salamanders;
- proposed management activities, such as managed grazing, management of invasive plants, measures targeted at sustaining populations of burrowing mammals, or other measures to maintain high-quality habitat for California tiger salamanders;
- a description of species monitoring measures on the mitigation site, including specific, objective goals and objectives (including maintaining or improving habitat suitability for California tiger salamanders), performance indicators and success criteria (including maintaining or increasing the abundance of upland refugia for California tiger salamanders), monitoring methods (such as sampling of the abundance of upland refugia), data analysis, reporting requirements, and monitoring schedule. Determining other specific performance/success criteria requires information regarding the specific mitigation site, its conditions, and the specific enhancement and management measures tailored to the mitigation site and its conditions. For example, performance criteria for a mitigation site providing only upland habitat for California tiger salamanders would include the maintenance of grassland habitat of a suitable height and density for burrowing mammals, and maintenance of suitable burrowing mammal populations, whereas a mitigation site providing salamander breeding habitat would also include criteria related to adequate depth and hydroperiod of breeding habitat. As a result, ~~those~~ additional specific criteria will be defined in the HMMP rather than in this SEIR. Nevertheless, the performance/success criteria described in the HMMP will guide the mitigation to manage and protect high-quality habitat for the California tiger salamander, adequate to compensate for impacts.

- a description of the management plan's adaptive component, including potential contingency measures for mitigation elements that do not meet performance criteria; and
- a description of the funding mechanism for the long-term maintenance and monitoring of the mitigation lands.

If lands that SCVWD currently owns, such as mitigation lands acquired for the California red-legged frog for the 2002–2012 SMP, can be enhanced (e.g., via the construction of breeding ponds) in such a way as to substantially improve their value to California tiger salamanders, then SCVWD may use those lands as mitigation for the California tiger salamander. After mitigation has been provided for impacts to a specific area supporting the California tiger salamander from a specific year's SMP Update activities, future (i.e., repetitive) impacts to that area will not require additional mitigation.

The HMMP will be provided to the USFWS and CDFG for review because this species is both state and federally listed. It is possible that this mitigation measure may be refined during the Section 7 consultation process with the USFWS (e.g., in the Biological Opinion covering Project effects on the California tiger salamander) or the Section 2081 consultation process with the CDFG (e.g., in an Incidental Take Permit), in which case the refinements required by these agencies would be implemented.

MM BIO-10 will mitigate impacts to the California tiger salamander to less-than-significant levels by enhancing, managing, and protecting habitat for this species so as to protect its populations, thereby ensuring that the SMP does not substantially reduce the number or restrict the range of this threatened/endangered species, have a substantial adverse effect on this special-status species, or impede the use of its nursery sites.

Impact BIO-12: Impacts on the California Red-Legged Frog (Significance Criteria A, B, and E; Less than Significant with Mitigation)

The California red-legged frog is federally listed as threatened and a California species of special concern. As described under *Determination of Impacts to Wildlife and Fisheries*, proposed maintenance activities may affect California red-legged frog habitat (breeding, foraging, or dispersal) and/or individuals (e.g., during maintenance activities or from increased mortality after construction). For example, maintenance activities may result in the injury or mortality of individuals as a result of worker foot traffic, equipment use, or vehicle traffic. Daily and seasonal movements throughout individuals' home ranges may be temporarily affected during maintenance activities because of disturbance, and substrate vibrations may cause individuals to move out of refugia, exposing them to a greater risk of predation or desiccation. In addition, red-legged frogs may be crushed in their burrows by the passage of heavy equipment or trapped and suffocated. Furthermore, petrochemicals, hydraulic fluids, and solvents that were spilled or leaked from construction vehicles or equipment, or spot-baiting associated with management of animal conflicts, may kill individuals of this species.

Removal of burrows in levees, a component of the management of animal conflicts, could impact California red-legged frogs because of the potential for these frogs to use burrows as refugia. Direct mortality of individuals may occur because of filling or compaction of crevices/holes on levee surfaces or slopes. In addition, the loss of subterranean habitat

caused by filling of burrows and the use of surface barriers to burrowing animals would reduce the availability of refugia, potentially subjecting dispersing frogs to increased predation or desiccation if they were unable to find suitable refugia. Control of burrowing mammal populations would reduce the availability of upland refugia for the frog. The extent of effects to California red-legged frog habitat resulting from management of animal conflicts is difficult to quantify because the extent of and specific locations for animal conflict management generally are not known. More than 12 miles of levees along Calera Creek and the Almaden Calero, Coyote Extension, and Coyote Canals occur in areas where the California red-legged frog is considered extant and where animal conflict management may occur. In addition, animal conflict management could occur in other non-projected locations within potential California red-legged frog habitat.

When performing any type of maintenance that would necessitate work within or adjacent to the active channel, SCVWD would implement BMPs (listed below) to reduce impacts to water quality (e.g., erosion and sediment control, spill prevention, standard herbicide requirements). Implementation of BMPs related to dewatering of work sites would assure that, before dewatering, the best means to bypass flow through a work site would be determined, to minimize disturbance to the channel and avoid direct mortality of aquatic animals such as amphibians. In addition, by implementing BMPs GEN-12 and GEN-15, red-legged frogs would be relocated from work sites before the onset of maintenance activities that potentially could threaten individuals of this species. However, individuals that were found during pre-activity surveys and relocated to suitable habitat outside of the work site may be subjected to physiological stress and greater risk of predation, or may undergo increased competition with frogs already present in the area to which they were relocated.

Similar to the California tiger salamander, the vast majority of proposed sediment removal activities would be in areas where red-legged frogs do not currently occur. Figure 3.3-13 depicts all projected activities relative to the expected distribution of this species in the Project Area, based on known occurrences (primarily from CNDDB 2011) and habitat suitability. As shown in this figure, red-legged frogs are largely absent from the portions of the Santa Clara Valley floor that have been heavily impacted by urban development and agricultural activities.

Since 2004, SCVWD has conducted annual surveys for the presence or absence of amphibians in numerous locations before the application of instream herbicides (see Table 3.3-3); no red-legged frogs were found at any of the locations listed in Table 3.3-3, suggesting that the distribution of this species in and near the Project Area is limited. This species is not known to breed in any of the areas where activities are proposed. Although breeding is possible, this species would be likely to occur sparingly as a non-breeding visitor, if at all, in most of the areas where Proposed Project activities would occur. Therefore, impacts to this species would be limited.

Because sediment removal is a projected activity for the SMP Update, the potential locations where sediment removal could impact red-legged frogs can be predicted. These locations are depicted in Figure 3.3-14 and summarized in Table 3.3-~~16~~17. For clarity, Figure 3.3-14 only shows the projected sediment removal activities within areas where the California red-legged frog is expected to be extant. No areas exist where sediment removal is projected in potential California red-legged frog habitat and where such sediment removal has occurred (or will occur) from 2002–2012. Therefore, all impacts to this

species from 2012–2022 would be new activities. Table 3.3-~~16~~17 takes the "work area percentage" into account, and thus the linear miles of sediment removal in this table represent a subset of the projected work areas shown in Figure 3.3-14. Unlike the California tiger salamander, impacts on California red-legged frogs may occur resulting from in-channel sediment removal activities.

Thus, although the exact acreage of sediment removal activities in predicted California red-legged frog habitat cannot be determined because the location of staging areas and channel access points are not yet known, the potential impact is estimated to be approximately 1–2 acres. Although the California red-legged frog has been recorded in or adjacent to some of the creeks in the Project Area (e.g., Saratoga Creek, Calabazas Creek, Guadalupe Creek, Coyote Creek, Dexter Canyon Creek), no occurrence records are located within the impact areas. Thus, with implementation of the BMPs discussed above, particularly BMP GEN-12 (Protection of Special-Status Amphibian and Reptile Species), the impact on this species would be very limited.

Table 3.3-~~16~~17. Projected Sediment Removal Impacts in Areas of Potential California Red-legged Frog Occurrence, 2012–2022

Creek/River	Sediment Removal Impacts, 2012–2022 (miles)
Alamitos Creek	0.04
Almaden-Calero Canal	0.63
Bodfish Creek	0.01
Calabazas Creek	0.03
Calero Creek	0.04
Coyote Creek	0.14
Guadalupe Creek	0.08
Llagas Creek	0.04
Saratoga Creek	0.01
Stevens Creek	0.01
Uvas-Carnadero Creek	0.00
Total	1.03

Source: Data compiled by Horizon Water and Environment in 2011 based on information from SCVWD

Because vegetation management is a projected activity for the SMP Update, the potential locations where vegetation management could impact red-legged frogs can be predicted. These locations are depicted in Figures 3.3-15, 3.3-16, and 3.3-17 and summarized in Table 3.3-~~17~~18. The table summarizes the acreage along each creek with potential red-legged frog habitat in which instream herbicide application, non-instream herbicide application, and manual vegetation management, respectively, have been projected from 2012–2022. Unlike the California tiger salamander, these three categories of vegetation management activities are described and shown separately for the red-legged frog because frogs, which potentially could breed in SCVWD creeks and are expected to use creeks and riparian habitats preferentially on the landscape, could potentially be impacted differently by these different types of activities. For example, instream herbicide application has greater

potential to result in adverse effects on red-legged frog eggs and larvae than non-instream herbicide application. Taking into account the overlap in areas where the different types of vegetation management would occur, vegetation management activities are projected to occur in a total of 35.42 acres of potential red-legged frog habitat.

Table 3.3-~~17~~18. Projected Vegetation Management Impacts in Areas of Potential California Red-legged Frog Occurrence, 2012–2022

Creek/River	Vegetation Management Impacts, 2012–2022 only (ac)	Vegetation Management Impacts, 2002–2010 and 2012–2022 (ac)	Total Vegetation Management Impacts, 2012–2022 (ac)
Instream Herbicide Application			
Adobe Creek		0.04	0.04
Alamitos Creek	0.04		0.04
Almaden-Calero Canal		0.32	0.32
Calero Creek	0.05		0.05
Cochran Channel		0.00	0.00
Coyote Canal		1.56	1.56
Coyote Canal Extension		0.52	0.52
Coyote Creek	0.48		0.48
Deer Creek	0.01		0.01
Edmundson Creek	0.03		0.03
Greystone Creek		0.01	0.01
Guadalupe Creek	0.09		0.09
Llagas Creek	0.09		0.09
Pajaro River	0.78		0.78
Prospect Creek	0.00		0.00
Randol Creek	0.00	0.03	0.03
Uvas-Carnadero Creek	0.30		0.30
West Branch Randol Creek	0.01		0.01
Total	**1.88**	**2.48**	**4.36**
Non-Instream Herbicide Application			
Adobe Creek		0.00	0.00
Almaden-Calero Canal		4.95	4.95
Calera Creek		0.19	0.19
Cochran Channel	0.24		0.24
Coyote Canal		3.28	3.28
Coyote Creek	0.39		0.39

Table 3.3-~~17~~18. Projected Vegetation Management Impacts in Areas of Potential California Red-legged Frog Occurrence, 2012–2022

Creek/River	Vegetation Management Impacts, 2012–2022 only (ac)	Vegetation Management Impacts, 2002–2010 and 2012–2022 (ac)	Total Vegetation Management Impacts, 2012–2022 (ac)
Deer Creek	0.02		0.02
Edmundson Creek	0.02	0.62	0.64
Evergreen Creek	0.02		0.02
Golf Creek	0.19		0.19
Greystone Creek	0.20	0.33	0.53
Llagas Creek	0.19		0.19
Pajaro River	1.49		1.49
Prospect Creek	0.00		0.00
Randol Creek	0.00	2.60	2.60
Saratoga Creek	0.54		0.54
Stevens Creek	0.04		0.04
Thompson Creek	0.05		0.05
Uvas-Carnadero Creek	0.14		0.14
West Branch Randol Creek	0.62		0.62
West Little Llagas Creek	0.49	2.36	2.84
Total	**4.64**	**14.33**	**18.97**
Manual Vegetation			
Alamitos Creek	0.19		0.19
Almaden-Calero Canal	6.92		6.92
Bodfish Creek	0.16		0.16
Calabazas Creek	0.01		0.01
Calera Creek	0.29		0.29
Calero Creek	0.09		0.09
Coyote Creek	2.62		2.62
Cribari Creek	0.00		0.00
Deer Creek	0.02		0.02
Edmundson Creek	0.19	0.72	0.91
Evergreen Creek	0.03		0.03
Golf Creek	0.12		0.12
Greystone Creek	0.21		0.21
Guadalupe Creek	0.51		0.51
Lions Creek	0.00		0.00

Table 3.3-~~17~~18. Projected Vegetation Management Impacts in Areas of Potential California Red-legged Frog Occurrence, 2012–2022

Creek/River	Vegetation Management Impacts, 2012–2022 only (ac)	Vegetation Management Impacts, 2002–2010 and 2012–2022 (ac)	Total Vegetation Management Impacts, 2012–2022 (ac)
Llagas Creek	0.38	0.09	0.47
McAbee Creek	0.14		0.14
Pajaro River	2.26		2.26
Randol Creek	1.44		1.44
Saratoga Creek	0.09		0.09
Stevens Creek	0.00		0.00
Thompson Creek	5.31		5.31
Uvas-Carnadero Creek	1.82		1.82
West Branch Randol Creek	0.27		0.27
Total	**23.07**	**0.81**	**23.88**

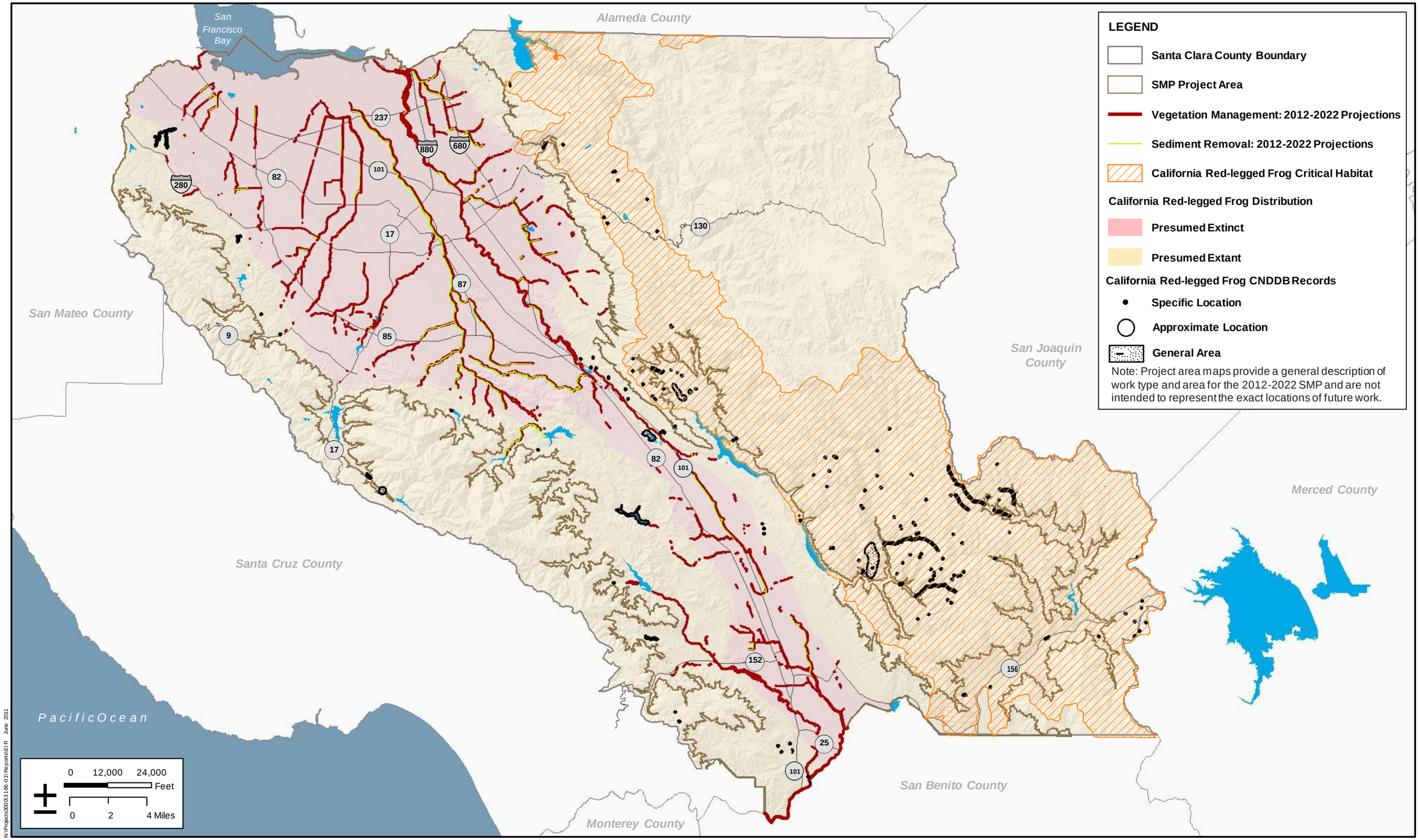
Source: Data compiled by Horizon Water and Environment in 2011 based on information from SCVWD

Although Figures 3.3-15 to 3.3-17 depict the stream reaches in which vegetation management activities are projected, not every area indicated as "projected" on these figures would actually be subject to vegetation management. As explained previously, a "work area percentage" has been applied to some reaches in which only a certain percentage of the reach would undergo management activities. Table 3.3-~~17~~18 takes the "work area percentage" into account, and thus the acreages of vegetation management in this table represent a subset of the projected work areas shown on the corresponding figures.

Much of the projected vegetation management work would occur on levee tops and upper banks, not in the channel habitat where the frogs are expected to concentrate their activities. Thus, the potential for direct effects on red-legged frogs during vegetation management activities on the levees is substantially less than the potential during similar work in aquatic habitats.

Mitigation activities such as gravel augmentation (Mitigation Measure BIO-8) and installation of instream complexity (Mitigation Measure BIO-9) could result in impacts to aquatic species during installation; however, the net effect of these measures on fish and amphibians would be beneficial.

Vegetation management activities would include the application of herbicides, as discussed above. Herbicides have the potential to result in adverse effects on California red-legged frogs as a direct effect on the survival, reproduction, and growth of the frog itself, as well as indirect effects, such as reduction of the prey base or modification of its habitat.



H. T. HARVEY & ASSOCIATES
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Figure 3.3-13: Known and Expected California Red-legged Frog Distribution in Santa Clara County

Santa Clara Valley Water District Stream Maintenance Program EIR (3166-01)

July 2011

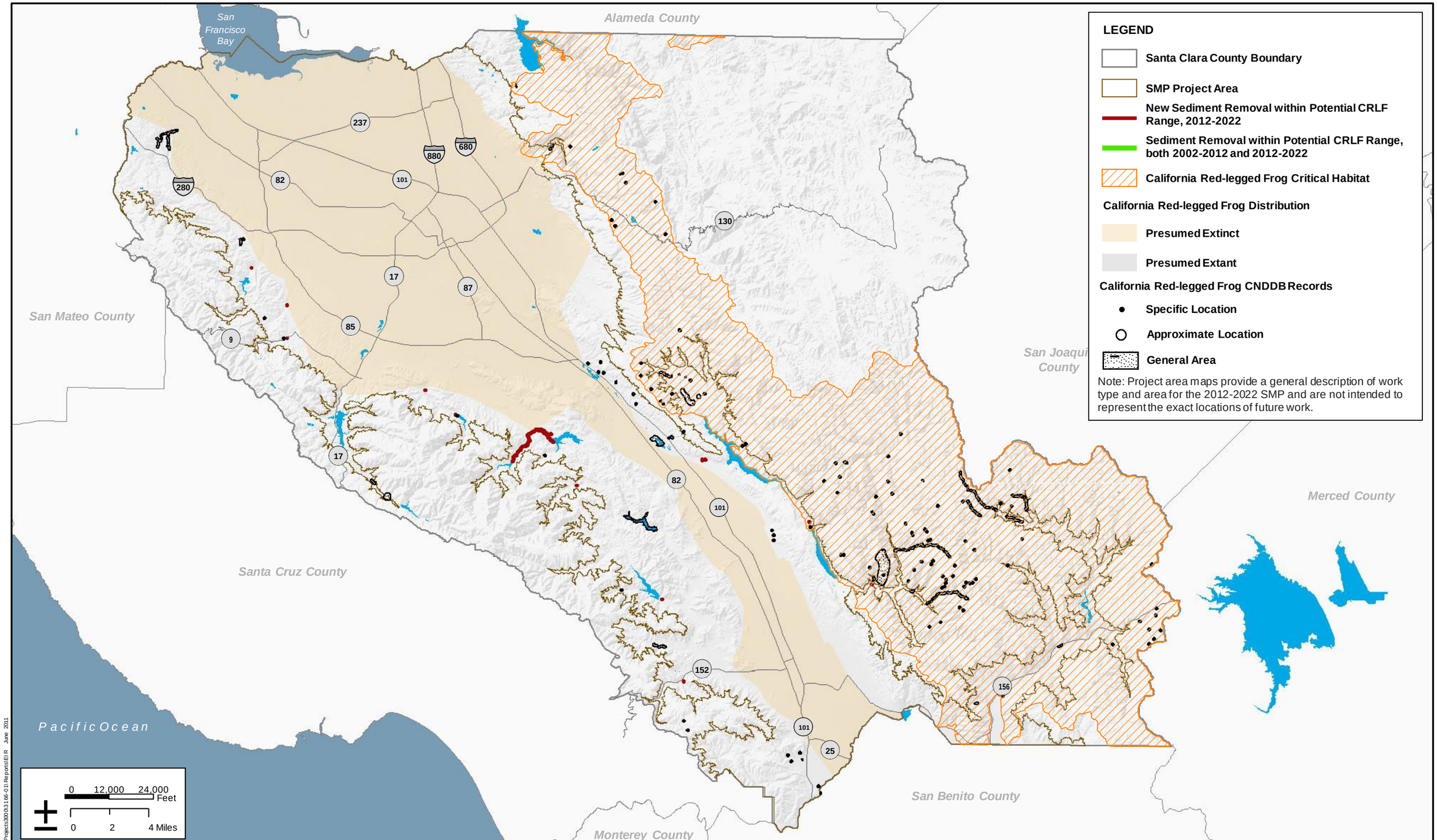

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Figure 3.3-14: Projected Sediment Removal in Areas of Potential California Red-legged Frog Occurrence, 2012-2022

Santa Clara Valley Water District Stream Maintenance Program EIR (3166-01)

July 2011

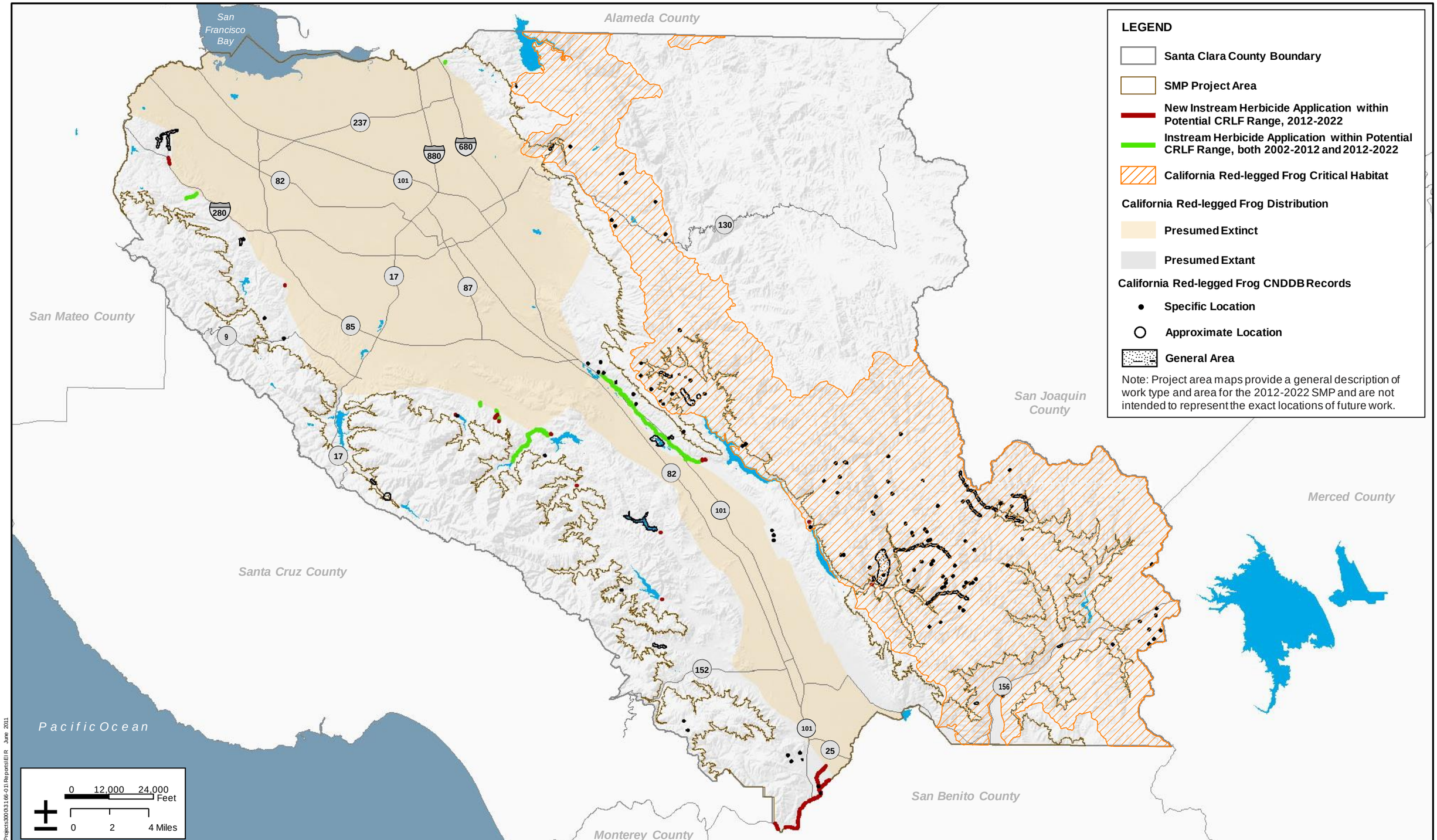

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Figure 3.3-15: Projected Instream Herbicide Application in Areas of Potential California Red-legged Frog Occurrence, 2012-2022

Santa Clara Valley Water District Stream Maintenance Program EIR (3166-01)

July 2011

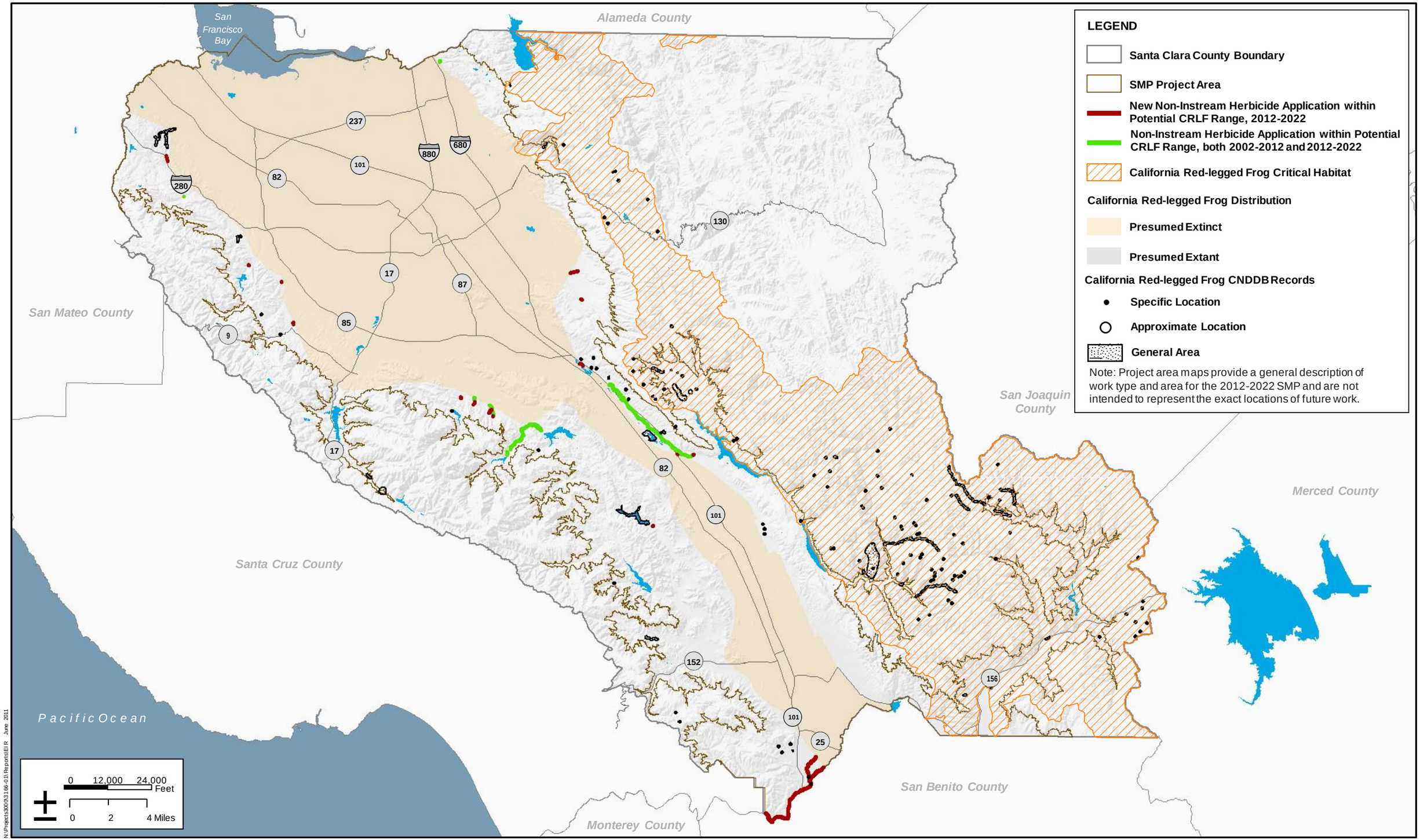

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Figure 3.3-16: Projected Non-Instream Herbicide Application in Areas of Potential California Red-legged Frog Occurrence, 2012-2022

Santa Clara Valley Water District Stream Maintenance Program EIR (3166-01)

July 2011

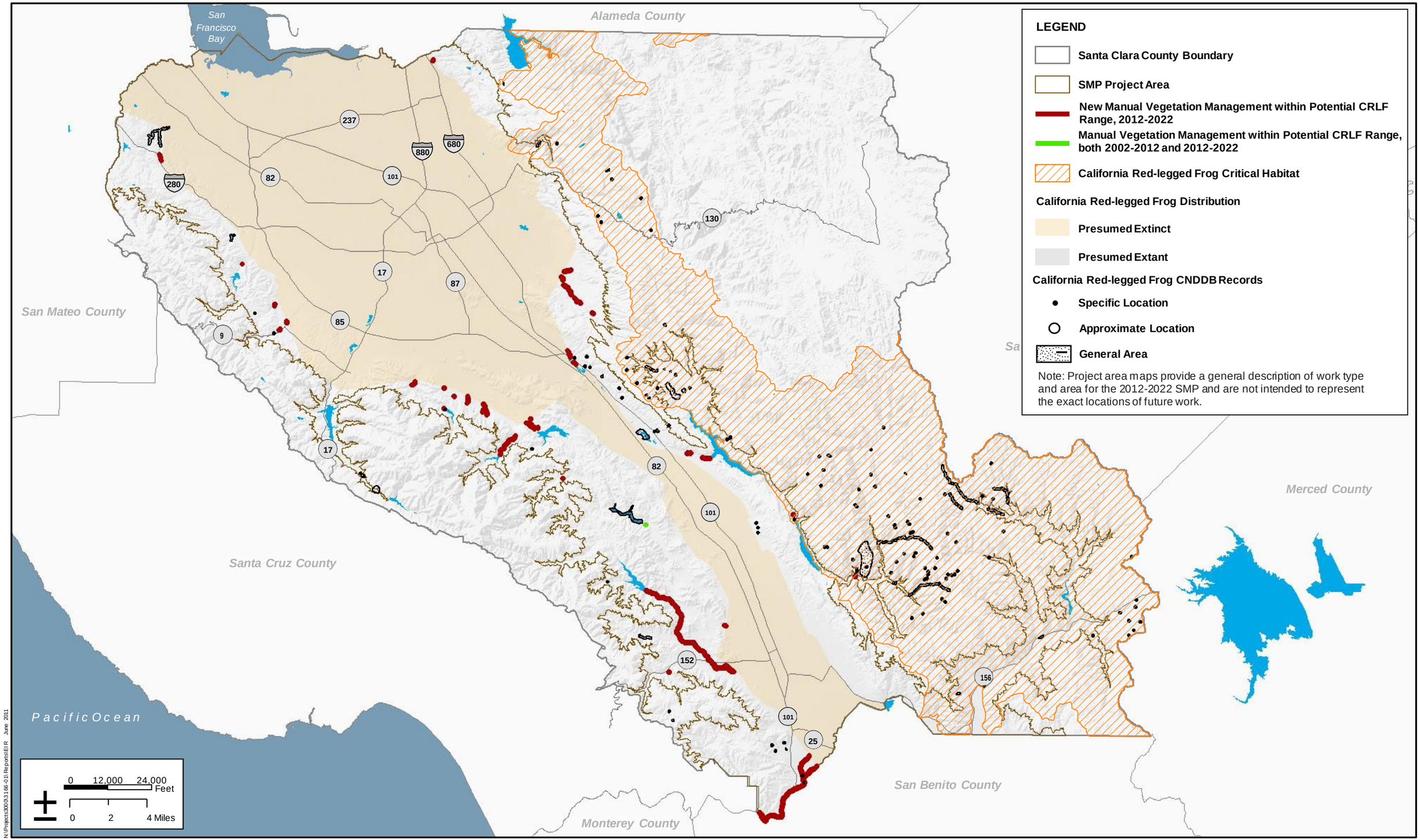

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Figure 3.3-17: Projected Manual Vegetation Management in Areas of Potential California Red-legged Frog Occurrence, 2012-2022

Santa Clara Valley Water District Stream Maintenance Program EIR (3166-01)

July 2011

USEPA has conducted ecological risk assessments to determine the potential risks of labeled uses of several herbicides, including four proposed for use by SCVWD (glyphosate, imazapyr, pendimethalin, and triclopyr), on the federally listed California red-legged frog. Evaluated herbicides proposed for use by SCVWD are as follows, with a summary of USEPA's effects determination:

- Glyphosate: Likely to adversely affect aquatic-phase California red-legged frog via indirect effects through reduction in prey (non-vascular plants) and habitat (aquatic and terrestrial plants). There are no direct effects on the aquatic-phase California red-legged frog for any of the terrestrial or aquatic uses. Likely to adversely affect the terrestrial-phase California red-legged frogs via both direct effects and indirect effects following reduction in prey (terrestrial invertebrates, terrestrial-phase amphibians and mammals) and habitat (terrestrial plants). Further, glyphosate is predicted to result in modification to RLF critical habitat.
- Imazapyr: Likely to adversely affect the California red-legged frog via indirect effects on habitat and/or primary productivity (i.e., ecosystem structure and function for both the aquatic plant community and riparian vegetation). Critical habitat may also be modified. No direct effects are anticipated.
- Pendimethalin: Likely to adversely affect the California red-legged frog via both direct and indirect effects on both terrestrial and aquatic phases of the California red-legged frog. Critical habitat may also be modified.
- Triclopyr: Likely to adversely affect the California red-legged frog via both direct and indirect effects on both terrestrial and aquatic phases of the California red-legged frog. Critical habitat may also be modified.

SCVWD would use a surfactant to enhance the performance of herbicides. Surfactants aid the ability of an herbicide to penetrate the surface of vegetation by increasing its ability to spread over vegetation, stick to foliage, and penetrate thick cuticles. Most aquatic herbicides either require or highly recommend the use of a surfactant to achieve reasonable levels of control. In instances where surfactants are absent from the tank mix, the level of control often is reduced. A reduction in control would cause a greater return frequency, which would translate to more herbicide being used in the system and more frequent disturbance to the site.

In general, aquatic species (e.g., fish and amphibians) are more susceptible to adverse effects than terrestrial wildlife because of the potential for surfactants to alter cell permeability, thus increasing the potential for absorption of chemicals through their thin, moist skin. Some surfactants, particularly those that are nonylphenol-based, have been documented to result in chemical-induced lethargy and unconsciousness in fish, which can result in an increased risk of predation as well as have estrogenic effects (Smith et al. 2004, USFS 2007). However, SCVWD proposes to limit surfactant use of products documented to have the least toxic affect to aquatic life, Agri-dex and Competitor. Both of these surfactants are oil-based (Competitor is vegetable oil-based and the primary ingredient in Agri-dex is a paraffin-based oil) and function by increasing the absorption of herbicides through plant tissues. They are especially useful in increasing the penetration of herbicides through the bark of woody brush or tree stems (Bakke 2007). A study on the toxicity of surfactants to juvenile rainbow trout concluded that Agri-dex was less toxic to rainbow trout than two other commonly used surfactants, R-11 and LI 700 (Smith et al. 2004), and the *2006*

Supplemental Environmental Assessment of NOAA Fisheries Implementation Plan for the Community Based Restoration Program (NOAA 2006) concluded that Agri-dex was among the surfactants least toxic to marine and aquatic organisms (it is unknown whether Competitor was assessed).

Although USEPA has determined that the pesticides listed above are likely to affect adversely the California red-legged frog, formal consultation between USEPA and USFWS has not been completed. Therefore, USEPA has not yet concluded whether each of these pesticides' registration, label, or use instructions needs to be altered so that use of a pesticide will not take or jeopardize the continued existence of the California red-legged frog. SCVWD would continue to use herbicides in compliance with existing applicable state and federal laws and in accordance with the voluntary guidelines established in the PRESCRIBE database managed by the California Department of Pesticide Regulation, which restricts the use of pendimethalin and triclopyr in habitat occupied by the California red-legged frog.

In addition, SCVWD would follow the herbicide use guidelines established in its quality and environmental management system documents, including Q751D02 (*Control of Oversight of Pesticide Use*) and WW75100 (*Vegetation Control Work Instructions*), and the 2012 SMP Manual (Appendix A). These guidelines require that all use of herbicide have the appropriate biological surveys and clearances and that all herbicide applications have a pest control recommendation, provided by a California licensed pest control advisor. A recommendation is provided after each site is surveyed and the most appropriate control methods for the site are determined. Furthermore, to minimize the potential for direct impacts of herbicides on California red-legged frogs, aquatic herbicides can only be used in areas of suitable red-legged frog habitat when the creek is dry and no rain is forecast for the next 48 hours (i.e., when these semi-aquatic species are unlikely to be present).

Critical habitat has been designated for the California red-legged frog (Figure 3.3-13). Projected activities have the potential to affect approximately 1.10 acres of designated critical habitat for the species in ways described above and under *Determination of Impacts to Wildlife and Fisheries*. Specifically, Proposed Project activities could affect the PCEs of critical habitat involving aquatic breeding and non-breeding habitat, upland habitat, and dispersal habitat for the California red-legged frog, as described generally for habitat impacts above. However, adverse effects of Proposed Project activities on red-legged frog critical habitat would be limited to very small areas near the northern end of Coyote Reservoir and the junction of Dexter Creek and Coyote Creek.

SCVWD would implement the following BMPs to reduce impacts to individual California red-legged frogs and their habitats. A description of each BMP is provided in Table 2-12.

Applicable Best Management Practices

BMP GEN-2: Instream Herbicide Application Work Window
BMP GEN-4: Minimize the Area of Disturbance
BMP GEN-8: Protection of Sensitive Fauna Species from Herbicide Use
BMP GEN-12: Protection of Special-Status Amphibian and Reptile Species
BMP GEN-15: Salvage Native Aquatic Vertebrates from Dewatered Channels
BMP GEN-20: Erosion and Sediment Control Measures

BMP GEN-23: Stream Access
BMP GEN-26: Spill Prevention and Response
BMP GEN-30: Vehicle and Equipment Maintenance
BMP GEN-32: Vehicle and Equipment Fueling
BMP GEN-33: Dewatering for Non-Tidal Sites
BMP GEN-35: Pump/Generator Operations and Maintenance
BMP SED-2: Prevent Scour Downstream of Sediment Removal
BMP VEG-1: Minimize Local Erosion Increase from In-Channel Vegetation Removal
BMP VEG-3: Use Appropriate Equipment for Instream Removal
BMP BANK-1: Bank Stabilization Design to Prevent Erosion Downstream
BMP BANK-2: Concrete Use near Waterways
BMP ANI-1: Avoid Redistribution of Rodenticides
BMP ANI-4: Animal Control in Sensitive Amphibian Habitat

Conclusion

Implementation of these BMPs would reduce impacts California red-legged frog and its habitat. However, residual impacts to the California red-legged frog would remain because complete avoidance of impacts to this species and its habitat could not be avoided. Because of the regional rarity of the California red-legged frog, any impacts to this species and its habitats would be considered significant (Significance Criteria A, B, and E). Implementation of Mitigation Measure BIO-11 would reduce the impact to the California red-legged frog to a less-than-significant level.

As discussed under Impacts BIO-1 and BIO-2, Mitigation Measure BIO-1 and Mitigation Measure BIO-2 would require SCVWD to provide compensatory mitigation for impacts to wetland, aquatic, and riparian habitats. This mitigation may take a variety of forms, and not all of this mitigation would occur in areas where California red-legged frog occurred. However, Mitigation Measure BIO-1 and Mitigation Measure BIO-2 could result in benefits to red-legged frog through wetland and riparian habitat restoration and the protection and management of mitigation lands that may support this species. Nevertheless, Mitigation Measure BIO-11 would be implemented to reduce the impact on the California red-legged frog and its habitat to a less-than-significant level.

Mitigation Measure BIO-11: Implement Compensatory Mitigation for the California Red-Legged Frog

SCVWD will provide mitigation to compensate for unavoidable impacts to California red-legged frogs and their habitat. SCVWD would refine the quantification of impacts to California red-legged frog habitat on an annual basis. At the end of each year's maintenance period, SCVWD will determine the extent of impacts to lands that are both within the potential range of the California red-legged frog and within potentially suitable habitat for the species. To determine whether the SMP impacts are within the potential range of the species, SCVWD will rely on the mapping in Figure 3.3-13 (which may be as modified over the course of 2012–2022, based on any new information that may modify the understanding of the species' potential range in the Project Area). To determine habitat suitability, an SCVWD biologist will determine whether the impact areas support land uses that are not conducive to California red-legged frog use, such as developed lands; all other land uses will be considered potential California red-legged frog habitat.

Compensation for these effects will be provided via the protection, enhancement, and management of habitat that currently supports, or could support, this species at a 2:1 (mitigation:impact~~:mitigation~~) ratio, on an acreage basis. Compensatory mitigation may be carried out through one or both of the following methods, in order of preference:

- The preservation, management, and enhancement (e.g., through long-term management targeted toward this species) of high-quality habitat that is already occupied by California red-legged frogs
- The restoration or enhancement of degraded habitat or habitat that is unsuitable for use by California red-legged frogs, but that (a) is in close proximity to areas of known occurrence and (b) could be made more suitable for use via construction of one or more breeding ponds, enhancement of breeding and non-breeding aquatic habitat via improvements to emergent vegetation or other cover, or management to improve the quality of upland habitat

Because much of the impact to California red-legged frog habitat will consist of modification of upland refugial/dispersal habitat (rather than aquatic breeding or foraging habitat), the mitigation lands will include upland habitat for this species. All mitigation lands for this species must be located within Santa Clara County and within the area where the species is thought to be extant as shown in Figure 3.3-13 (or as otherwise modified over the course of 2012–2022, based on any new information that may modify the understanding of the species' potential range in the Project Area). SCVWD will develop an HMMP describing the measures that will be taken to manage the property and to monitor the effects of management on the California red-legged frog; the HMMP will include components similar to those described for California tiger salamanders, including the maintenance or improvement of habitat conditions and components (i.e., refugia in dispersal habitat). Determining other specific performance/success criteria for this mitigation requires information regarding the specific mitigation site, its conditions, and the specific enhancement and management measures tailored to the mitigation site and its conditions. For example, performance criteria for a mitigation site providing only upland habitat for California red-legged frogs would include the maintenance of grassland habitat of a suitable height and density for use by dispersing frogs, whereas a mitigation site providing red-legged frog breeding habitat would also include criteria related to adequate depth and hydroperiod of breeding habitat and suitable vegetative cover. As a result, ~~those~~ additional specific criteria will be defined in the HMMP rather than in this SEIR. Nevertheless, the performance/success criteria described in the HMMP will guide the mitigation to manage and protect high-quality habitat for the California red-legged frog, adequate to compensate for impacts.

After mitigation has been provided for impacts to a specific area supporting the California red-legged frog from a specific year's activities, future (i.e., repetitive) impacts to that area will not require additional mitigation.

The HMMP will be provided to the USFWS for review because the California red-legged frog is a federally listed species regulated by the USFWS. It is possible that this mitigation measure may be refined during the Section 7 consultation process with the USFWS (e.g., in the Biological Opinion covering Project effects on the California red-legged frog), in which case the refinements required by the USFWS would be implemented.

MM BIO-11 will mitigate impacts to the California red-legged frog to less-than-significant levels by enhancing, managing, and protecting habitat for this species so as to protect its populations, thereby ensuring that the SMP does not substantially reduce the number or restrict the range of this threatened species, have a substantial adverse effect on this special-status species, or impede the use of its nursery sites.

Impact BIO-13: Impacts on the Foothill Yellow-Legged Frog (Significance Criteria A, B, and E; Less than Significant)

The foothill yellow-legged frog is a California species of special concern. Like the California red-legged frog discussed under Impact BIO-12, it is associated with aquatic habitats in the Project Area. The types of impacts that could occur to foothill yellow-legged frog and the mechanisms by which these impacts could occur would be very similar to those described under *Determination of Impacts to Wildlife and Fisheries* and to those described for the California red-legged frog; thus, those impacts are not repeated here. However, the foothill yellow-legged frog's distribution in the Project Area (Figure 3.3-18) is even more limited than that of the red-legged frog. Figure 3.3-18 depicts all projected activities relative to the expected distribution of this species in the Project Area, based on known occurrences (primarily from CNDDB 2011) and habitat suitability. As shown in this figure, the foothill yellow-legged frog is absent from all but a very small proportion of the areas where activities are projected. Yellow-legged frog is expected to occur primarily above the reservoirs along creeks, and thus activities associated with stream gauges (such as limited sediment removal and vegetation management), and possibly minor maintenance activities, would be the main activities that could affect yellow-legged frog.

Table 3.3-~~18~~19 indicates the linear miles of creek in which sediment removal activities are projected in potential foothill yellow-legged frog habitat, and Table 3.3-~~19~~20 indicates the acreage of projected ~~sediment removal~~vegetation management in potential foothill yellow-legged frog habitat. As shown in these tables, impacts to areas where this species may occur would be very limited. Since 2004, SCVWD has conducted annual surveys for the presence or absence of amphibians in numerous locations before the application of instream herbicides (see Table 3.3-3); yellow-legged frogs have never been found at any of the locations listed in Table 3.3-3, suggesting that the distribution of these species in and near the Project Area is so limited that impacts would be very low.

Table 3.3-~~18~~19. Projected Sediment Removal Impacts in Areas of Potential Foothill Yellow-legged Frog Occurrence, 2012–2022

Creek/River	Sediment Removal Impacts, 2012–2022 (miles)
Bodfish Creek	0.02
Coyote Creek	0.28
Guadalupe Creek	0.16
Llagas Creek	0.11
Uvas-Carnadero Creek	<0.01
Total	**0.57**

Source: Data compiled by Horizon Water and Environment in 2011 based on information from SCVWD

Table 3.3-~~19~~20. Projected Vegetation Management Impacts in Areas of Potential Foothill Yellow-legged Frog Occurrence, 2012–2022

Creek/River	Vegetation Management Impacts, 2012–2022 (ac)
Instream Herbicide Application	
Coyote Creek	0.18
Guadalupe Creek	0.09
Llagas Creek	<0.01
Uvas-Carnadero Creek	0.03
Total	0.30
Manual Vegetation Management	
Bodfish Creek	0.16
Coyote Creek	0.92
Guadalupe Creek	0.09
Llagas Creek	0.09
Uvas-Carnadero Creek	0.37
Total	**1.63**

Source: Data compiled by Horizon Water and Environment in 2011 based on information from SCVWD

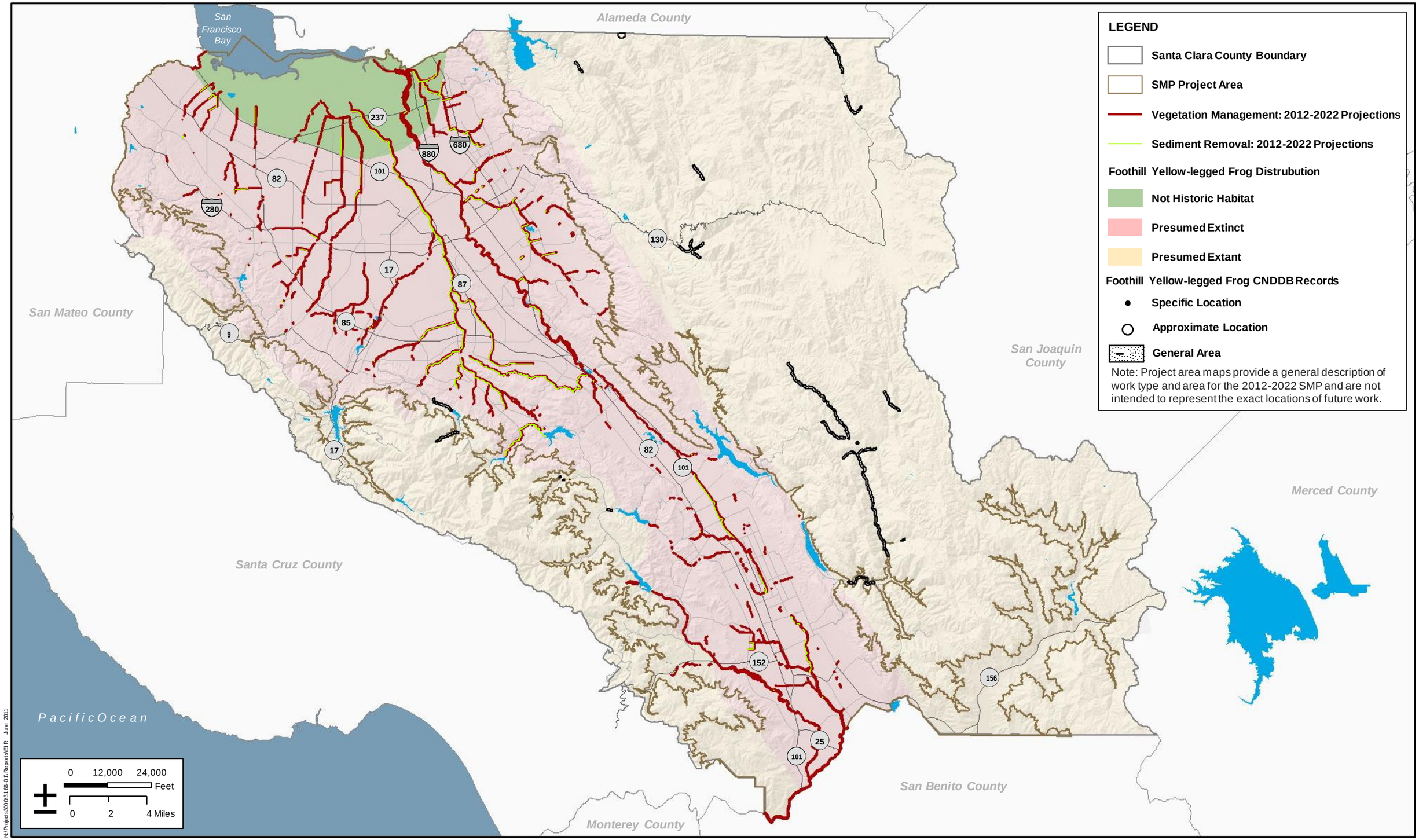

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Figure 3.3-18: Known and Expected Foothill Yellow-legged Frog Distribution in Santa Clara County

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SCVWD would implement the following BMPs to reduce impacts to individual foothill yellow-legged frogs and their habitats. A description of each BMP is provided in Table 2-12.

Applicable Best Management Practices

BMP GEN-2: Instream Herbicide Application Work Window
BMP GEN-4: Minimize the Area of Disturbance
BMP GEN-8: Protection of Sensitive Fauna Species from Herbicide Use
BMP GEN-12: Protection of Special-Status Amphibian and Reptile Species
BMP GEN-15: Salvage Native Aquatic Vertebrates from Dewatered Channels
BMP GEN-20: Erosion and Sediment Control Measures
BMP GEN-23: Stream Access
BMP GEN-26: Spill Prevention and Response
BMP GEN-30: Vehicle and Equipment Maintenance
BMP GEN-32: Vehicle and Equipment Fueling
BMP GEN-33: Dewatering for Non-Tidal Sites
BMP GEN-35: Pump/Generator Operations and Maintenance
BMP SED-2: Prevent Scour Downstream of Sediment Removal
BMP VEG-1: Minimize Local Erosion Increase from In-Channel Vegetation Removal
BMP VEG-3: Use Appropriate Equipment for Instream Removal
BMP BANK-1: Bank Stabilization Design to Prevent Erosion Downstream
BMP BANK-2: Concrete Use near Waterways
BMP ANI-1: Avoid Redistribution of Rodenticides
BMP ANI-4: Animal Control in Sensitive Amphibian Habitat

Conclusion

Implementation of BMPs would reduce impacts to individual foothill yellow-legged frogs and their habitats considerably. Impacts would occur in such limited areas in which the species could be present, thus affecting such a low number of individuals that implementing these BMPs would be adequate to assure impacts would be less-than-significant.

Although no mitigation would be needed to reduce the impact to foothill yellow-legged frog to a less-than-significant level, a number of mitigation measures for other impacts would benefit this species. As discussed under Impacts BIO-1 and BIO-2, Mitigation Measure BIO-1 and Mitigation Measure BIO-2 would require SCVWD to provide compensatory mitigation for impacts to wetland, aquatic, and riparian habitats. This mitigation may take a variety of forms, and not all such mitigation would occur in areas that would directly benefit the yellow-legged frog. However, Mitigation Measure BIO-1 and Mitigation Measure BIO-2 would result in wetland, aquatic, and riparian habitat restoration, enhancement, and protection, which would benefit the yellow-legged frog in areas where these mitigation measures would overlap with the yellow-legged frog's current range.

Impact BIO-14: Impacts on Non-Special-Status Fish and Amphibians (Significance Criteria A and E; Less than Significant with Mitigation)

As discussed in Section 3.3.3, *Environmental Setting*, the rivers and creeks of Santa Clara County are home to 12 native species of fish (SCVWD 1995, Leidy 2007). In addition to the special-status fish mentioned under Impacts BIO-8, 9, and 10, native fish such as the California roach, hitch, Sacramento sucker, threespine stickleback, and others are present in the Project Area.

Small numbers of the fall-run Chinook salmon also are known to occur in the Project Area, in Coyote Creek, Los Gatos Creek, and the Guadalupe River (Leidy et al. 2003). This species uses the lower reaches of Coyote Creek and Alviso Slough as migration corridors between estuarine habitats and upstream spawning and rearing habitats. However, genetic analysis has confirmed that Chinook in South Bay streams are all derived from hatchery stock (Hedgecock 2002), and conditions for successful spawning in the Project Area are marginal because of low water levels in the creeks in fall, when this species typically spawns. Likewise, several species of non-special-status amphibians, such as the western toad and Pacific chorus frog use Project Area creeks as breeding and foraging habitat.

Various Proposed Project activities would impact non-special-status fish and amphibians in the Project Area, in ways described under *Determination of Impacts to Wildlife and Fisheries*. The non-special-status fish and amphibians that would be impacted by the Proposed Project are relatively abundant and widespread, with the exception of the Chinook salmon, which is not native to South Bay streams. As a result, any one maintenance activity would not result in a substantial effect on regional populations. However, over the entire geographic and temporal scope of the SMP Update, Proposed Project activities could have the potential to impact relatively large numbers of non-special-status fish and amphibians, which would result in modifications to extensive areas of their habitats. In addition, mitigation activities such as gravel augmentation (Mitigation Measure BIO-8) and installation of instream complexity (Mitigation Measure BIO-9) could result in impacts to aquatic species during installation; however, the net effect of these measures on fish and amphibians would be beneficial.

When performing any type of maintenance activity that would necessitate work within or adjacent to the active channel, SCVWD would implement BMPs to reduce impacts to water quality (e.g., erosion and sediment control, spill prevention, standard herbicide requirements). In addition, implementation of BMPs related to dewatering of work sites would assure that, before dewatering, the best means to bypass flow through a work site would be determined, to minimize disturbance to the channel and avoid direct mortality of fish. Sediment removal BMPs would assure that low-flow channels within non-tidal streams were configured with the appropriate depth for fish passage. All the BMPs that would be implemented to reduce impacts to non-special-status fish and amphibians are as follows, and a description of each is provided in Table 2-12.

Applicable Best Management Practices

BMP GEN-4: Minimize the Area of Disturbance
BMP GEN-2: Instream Herbicide Application Work Windows
BMP GEN-15: Salvage Native Aquatic Vertebrates from Dewatered Channels
BMP GEN-20: Erosion and Sediment Control Measures
BMP GEN-236: Stream Access
BMP GEN-26: Spill Prevention and Response
BMP GEN-30: Vehicle and Equipment Maintenance
BMP GEN-32: Vehicle and Equipment Fueling
BMP GEN-32: Dewatering for Non-Tidal Sites
BMP GEN-34: Dewatering in Tidal Work Areas
BMP GEN-35: Pump/Generator Operations and Maintenance
BMP SED-2: Prevent Scour Downstream of Sediment Removal
BMP SED-3: Restore Channel Features
BMP VEG-1: Minimize Local Erosion Increase from In-Channel Vegetation Removal
BMP VEG-3: Use Appropriate Equipment for Instream Removal
BMP BANK-1: Bank Stabilization Design to Prevent Erosion Downstream
BMP BANK-2: Concrete Use near Waterways

Conclusion

Implementation of these BMPs would reduce impacts to populations and habitat of non-special-status fish and amphibians. However, residual impacts would remain. Because of the broad scope of the SMP Update—the number of these species that would be affected directly and indirectly, and the extent of habitat impacts—the collective Proposed Project activities would have the potential to substantially affect the population. Thus, impacts to individuals and their habitats resulting from the Proposed Project would be significant (Significance Criterion A).

As discussed under Impacts BIO-1 and BIO-2, Mitigation Measure BIO-1 and Mitigation Measure BIO-2 would require SCVWD to provide compensatory mitigation for impacts to wetland, aquatic, and riparian habitats. This mitigation may take a variety of forms, but all potential mitigation for impacts to those habitats would benefit non-special-status fish or amphibians, either directly or indirectly. Mitigation Measure BIO-1 and Mitigation Measure BIO-2 would result in benefits to these species through wetland, aquatic, and riparian habitat restoration, enhancement, and protection, which would help to maintain water quality, cover, and instream habitat complexity for them. In addition, implementation of Mitigation Measure BIO-9 would increase instream complexity, and thus would be expected to benefit non-special-status fish or amphibians in a manner similar to that described for steelhead. Mitigation Measure BIO-1, Mitigation Measure BIO-2, and Mitigation Measure BIO-9 would be implemented to reduce the impact to non-special-status fish and amphibians to a less-than-significant level.

Impact BIO-15: Impacts on Essential Fish Habitat (Significance Criteria A and D; Less than Significant)

As noted in Section 3.3.2, *Regulatory Setting*, the only fish species subject to a fisheries management plan that occurs in the Project Area with any regularity is the Chinook salmon, which is regulated by the Pacific Fishery Management Council's *Salmon Fishery Management Plan* (Pacific Fishery Management Council 1999). Although the Chinook salmon in the Project Area have been recognized as strays from hatchery releases (NMFS 1999, Hedgecock 2002), NMFS still considers habitat used by Chinook salmon in the South Bay as EFH.

Several fish species regulated by the *Pacific Groundfish Fisheries Management Plan* (Pacific Fishery Management Council 2008), such as the leopard shark, English sole, starry flounder, and big skate, occur in tidal habitats of South San Francisco Bay and occasionally disperse upstream into the reaches of Alviso Slough, Coyote Slough, Guadalupe Slough, Stevens Creek, San Francisquito Creek, Lower Penitencia Creek, Permanente Creek, Sunnyvale East and West Channels, and San Tomas Aquino Creek in the Project Area. Fish regulated by the *Coastal Pelagics Fisheries Management Plan* (Pacific Fishery Management Council 1998), such as the northern anchovy, Pacific sardine, and jack mackerel also occur in the South Bay but are less likely to occur in the uppermost tidal reaches of sloughs where Proposed Project activities would take place. Because of the presence of at least some species managed by one of these plans, these tidal waters possibly could be considered EFH.

The types of effects that Proposed Project activities could have on Chinook salmon and associated EFH that would support these species are the same as those described for steelhead under Impact BIO-8, with the caveat that only the impacts to CCC steelhead, occurring in the Santa Clara Basin would apply to Chinook salmon. Chinook salmon historically did not spawn in streams flowing into South San Francisco Bay. Since the mid-1980s, however, small numbers of fall-run Chinook salmon have been found in several such streams, including Coyote Creek, Los Gatos Creek, and the Guadalupe River in the Project Area (Leidy et al. 2003). However, genetic analysis, timing of spawning, and the detection of coded, wire-tagged hatchery fish in the Project Area suggest that these fish are derived from Central Valley fall-run stock (Garcia-Rossi and Hedgecock 2002), possibly hatchery releases. Conditions for successful spawning in the Project Area would be marginal because these fish spawn during fall when streamflow is at its lowest. As a result, up-migrating adults would have difficulty accessing spawning areas. Although spawning has been documented in SCVWD-maintained creeks, whether up-migrating adults have hatched on these creeks or if the adults that were observed were direct strays from other areas is unknown. Thus, no evidence exists that Chinook salmon have become naturalized in the Project Area.

Proposed Project activities would have limited effects on potential EFH in tidal waters, but such impacts may occur because of both projected sediment removal and vegetation management activities and unprojected activities (e.g., bank stabilization and minor maintenance). Sediment removal would occur in tidal areas only in the uppermost reach of Alviso Slough. Sediment removal activities would actually increase the extent of aquatic habitat for a few years, until sediment accumulation once again created wetlands within these aquatic habitats. However, during sediment removal, turbidity may increase, potentially affecting the health or foraging ability of fish in tidal waters.

Vegetation management activities would occur more widely adjacent to tidal waters; such activities would occur along San Francisquito Creek, the Sunnyvale West Channel, Moffett Channel, Guadalupe Slough, Coyote Slough, Alviso Slough, San Tomas Aquino Creek, and Permanente Creek. Some potential would exist for water-quality impacts caused by drift of herbicides into tidal sloughs containing EFH. Degradation of water quality may be particularly detrimental to young fish of species that use South Bay sloughs as nursery habitat.

Vegetation management activities in and adjacent to tidal sloughs would not result in a loss of EFH, although some vegetation removal would occur, causing a minor loss of habitat structure. Sediment removal areas within tidal channels projected from 2012–2022 would include only a very small amount of tidal channel that was not already impacted (and those impacts compensated for) from 2002–2012; this reach occurs in the Guadalupe River upstream from Gold Street. The reach of tidal channel in this area is short, and sediment removal from this area would not result in the loss of EFH. Therefore, no significant loss of EFH would occur.

The effects of Proposed Project activities on EFH and fish species regulated by the Coastal Pelagics and Pacific Groundfish Fisheries Management plans would not be substantial because of the limited overlap of Proposed Project activities with tidal waters. Furthermore, SCVWD would implement of the following BMPs to reduce impacts to fish and their habitat, including EFH; a description of each BMP is provided in Table 2-12.

Applicable Best Management Practices

BMP GEN-1: In-Channel Work Window
BMP GEN-2: Instream Herbicide Application Work Window
BMP GEN-4: Minimize the Area of Disturbance
BMP GEN-8: Protection of Sensitive Fauna Species from Herbicide Use
BMP GEN-20: Erosion and Sediment Control Measures
BMP GEN-23: Stream Access
BMP GEN-26: Spill Prevention and Response
BMP GEN-30: Vehicle and Equipment Maintenance
BMP GEN-32: Vehicle and Equipment Fueling
BMP GEN-33: Dewatering for Non-Tidal Sites
BMP GEN-34: Dewatering in Tidal Work Areas
BMP VEG-1: Minimize Local Erosion Increase from In-Channel Vegetation Removal
BMP VEG-3: Use Appropriate Equipment for Instream Removal
BMP BANK-2: Concrete Use near Waterways

Conclusion

Implementation of these BMPs would reduce impacts to EFH and associated fish species considerably. Because no evidence exists that Chinook salmon have naturalized in SCVWD-maintained creeks, Proposed Project activities are not expected to affect adversely the viability of this species' populations in the Project Area. As a result, with implementation of these BMPs, impacts on this species would be less than significant. Likewise, these BMPs would be adequate to assure the impacts to EFH and associated species in tidal areas would be less-than-significant.

Although no mitigation would be needed to reduce impacts to EFH to less-than-significant levels, a number of mitigation measures for other impacts would benefit EFH and associated species. As discussed under Impacts BIO-1 and BIO-2, Mitigation Measure BIO-1 and Mitigation Measure BIO-2 would require SCVWD to provide compensatory mitigation for impacts to wetland, aquatic, and riparian habitats. This mitigation may take a variety of forms, and not all such mitigation would occur in areas that would directly benefit EFH or associated species. However, Mitigation Measure BIO-1 and Mitigation Measure BIO-2 would result in benefits to fish through wetland, aquatic, and riparian habitat restoration, enhancement, and protection, which would help to maintain water quality, cover, and instream habitat complexity for these species. Mitigation Measure BIO-1 would incorporate a tidal wetland mitigation component that would benefit EFH species. In addition, implementation of Mitigation Measure BIO-8 would compensate for impacts to steelhead spawning gravel, which also would provide potential spawning habitat for the Chinook salmon. Mitigation Measure BIO-9 would increase instream complexity, and thus would be expected to benefit Chinook salmon in a manner similar to that described for steelhead.

Impact BIO-16: Impacts on the Western Pond Turtle
(Significance Criteria A, B, and E; Less than Significant with Mitigation)

Suitable habitat for the western pond turtle (a California species of special concern) consists of ponds or instream pools (i.e., slack water environments) with available basking sites, nearby upland areas with clay or silty soils for nesting, and shallow aquatic habitat with emergent vegetation and invertebrate prey for juveniles (Jennings and Hayes 1994). In the Project Area, all perennial creeks, many intermittent creeks, and most ponds (those not completely isolated by development) have some potential to support the western pond turtle. Figure 3.3-19 shows the known locations of this species in the county. Impacts of proposed stream maintenance activities may affect aquatic habitat used by western pond turtles for foraging or dispersal, upland habitat used for nesting, and individuals or populations of the species.

As described under *Determination of Impacts to Wildlife and Fisheries*, and similar to the California red-legged frog impact discussion, proposed maintenance activities may result in the injury or mortality of turtles. For example, individual turtles or their eggs may be directly harmed or killed during maintenance activities from crushing by construction personnel or equipment or as a result of desiccation or burying. Such impacts may occur because of both projected sediment removal and vegetation management activities and unprojected activities (e.g., bank stabilization, management of animal conflicts, and minor maintenance). In addition, riparian and upland areas that provide nesting habitat,

dispersal habitat, and refugia for western pond turtles may be temporarily or permanently lost during bank stabilization activities and the construction of temporary stream access routes. Activities requiring dewatering also would result in a temporary loss of aquatic habitat. Vegetation management may reduce instream habitat structure, including basking areas, vegetation that provides concealment from predators, and habitat that supports turtle prey. Mitigation activities such as gravel augmentation (Mitigation Measure BIO-8) and installation of instream complexity (Mitigation Measure BIO-9) could result in impacts to western pond turtles during installation; however, the net effect of these measures on turtles would be beneficial.

When performing any type of maintenance that necessitated work within or adjacent to the active channel, SCVWD would implement BMPs (listed below) to reduce impacts to water quality (e.g., erosion and sediment control, spill prevention, and standard herbicide requirements). Implementation of BMPs related to dewatering of work sites would assure that, before dewatering, the best means to bypass flow through a work site would be determined, to minimize disturbance to the channel and avoid direct mortality of aquatic animals. In addition, by implementing BMPs GEN-12 and GEN-15, western pond turtles would be relocated from the work site before the onset of maintenance activities. However, individuals that were found during pre-activity surveys and relocated to suitable habitat outside of the work site may be subjected to physiological stress and greater risk of predation, or may undergo increased competition with turtles already present in the area to which they were relocated.

SCVWD would implement of the following BMPs to reduce impacts to western pond turtles. A description of each BMP is provided in Table 2-12.

Applicable Best Management Practices

BMP GEN-2: Instream Herbicide Application Work Window
BMP GEN-4: Minimize the Area of Disturbance
BMP GEN-8: Protection of Sensitive Fauna Species from Herbicide Use
BMP GEN-12: Protection of Special-Status Amphibian and Reptile Species
BMP GEN-15: Salvage Native Aquatic Vertebrates from Dewatered Channels
BMP GEN-20: Erosion and Sediment Control Measures
BMP GEN-23: Stream Access
BMP GEN-26: Spill Prevention and Response
BMP GEN-30: Vehicle and Equipment Maintenance
BMP GEN-32: Vehicle and Equipment Fueling
BMP GEN-35: Pump/Generator Operations and Maintenance
BMP SED-2: Prevent Scour Downstream of Sediment Removal
BMP VEG-1: Minimize Local Erosion Increase from In-Channel Vegetation Removal
BMP VEG-3: Use Appropriate Equipment for Instream Removal
BMP BANK-1: Bank Stabilization Design to Prevent Erosion Downstream
BMP BANK-2: Concrete Use near Waterways

Conclusion

Implementation of these BMPs would reduce impacts to western pond turtles and their habitats. However, residual impacts would remain because it would not be feasible to avoid all individuals (particularly nests with eggs) and habitat loss while still meeting project goals and public health and safety directives. Although western pond turtles are widespread in the Project Area, the species is not particularly abundant there. Because individuals of this species can be long-lived, the widespread nature of the species in the Project Area may belie a population that likely would decline substantially in the future because of poor reproduction, as young turtles are seen in relatively few parts of the Project Area. Therefore, the loss of individuals or of important aquatic or upland habitat could reduce the viability of a population to the extent that it would be extirpated. This impact would be considered significant (Significance Criteria A, B, and E).

As discussed under Impacts BIO-1 and BIO-2, Mitigation Measure BIO-1 and Mitigation Measure BIO-2 would require SCVWD to provide compensatory mitigation for impacts to wetland, aquatic, and riparian habitats. This mitigation may take a variety of forms, but all mitigation for impacts to those habitats could benefit western pond turtle upland or aquatic habitat, directly or indirectly. Mitigation Measure BIO-1 and Mitigation Measure BIO-2 would result in benefits to this species through wetland, aquatic, and riparian habitat restoration, enhancement, and protection. These measures would help to maintain water quality, cover, and instream habitat complexity while protecting upland refugia and nesting habitat. In addition, implementation of Mitigation Measure BIO-9 would increase instream complexity; this complexity would include installation or improvement of large woody debris, instream flow wings, or other features that would compensate for the loss of turtle basking habitat as a result of the Proposed Project. Mitigation Measure BIO-1, Mitigation Measure BIO-2, and Mitigation Measure BIO-9 would be implemented to reduce the impact to the western pond turtle to a less-than-significant level.

Impact BIO-17: Impacts on the California Horned Lizard (Significance Criteria A, B, and E; Less than Significant)

The California horned lizard (a California species of special concern) is associated with a variety of open vegetation communities, including chaparral, coastal scrub, and annual grassland, as well as with clearings in riparian woodlands. These communities are characterized by sandy, loosely textured soils that are the lizards' preferred habitat (Jennings and Hayes 1994) and by the presence of native harvester ants (*Pogonomyrmex barbatus*), which are a primary part of their diet (Fisher et al. 2002). However, suitable habitat is scarce in the Project Area, and the species has been recorded from very few areas near projected work sites (Figure 3.3-19). As a result, this species likely would be present only in very low numbers in areas where it could be impacted by Proposed Project activities.

Nevertheless, some potential would exist for individuals of this species to be killed or injured during stream maintenance activities from crushing by construction personnel or equipment. Such impacts may occur because of both projected sediment removal and vegetation management activities and unprojected activities (e.g., bank stabilization, management of animal conflicts, and minor maintenance). In addition, the introduction of non-native Argentine ants, the modification of habitats to favor these ants instead of native

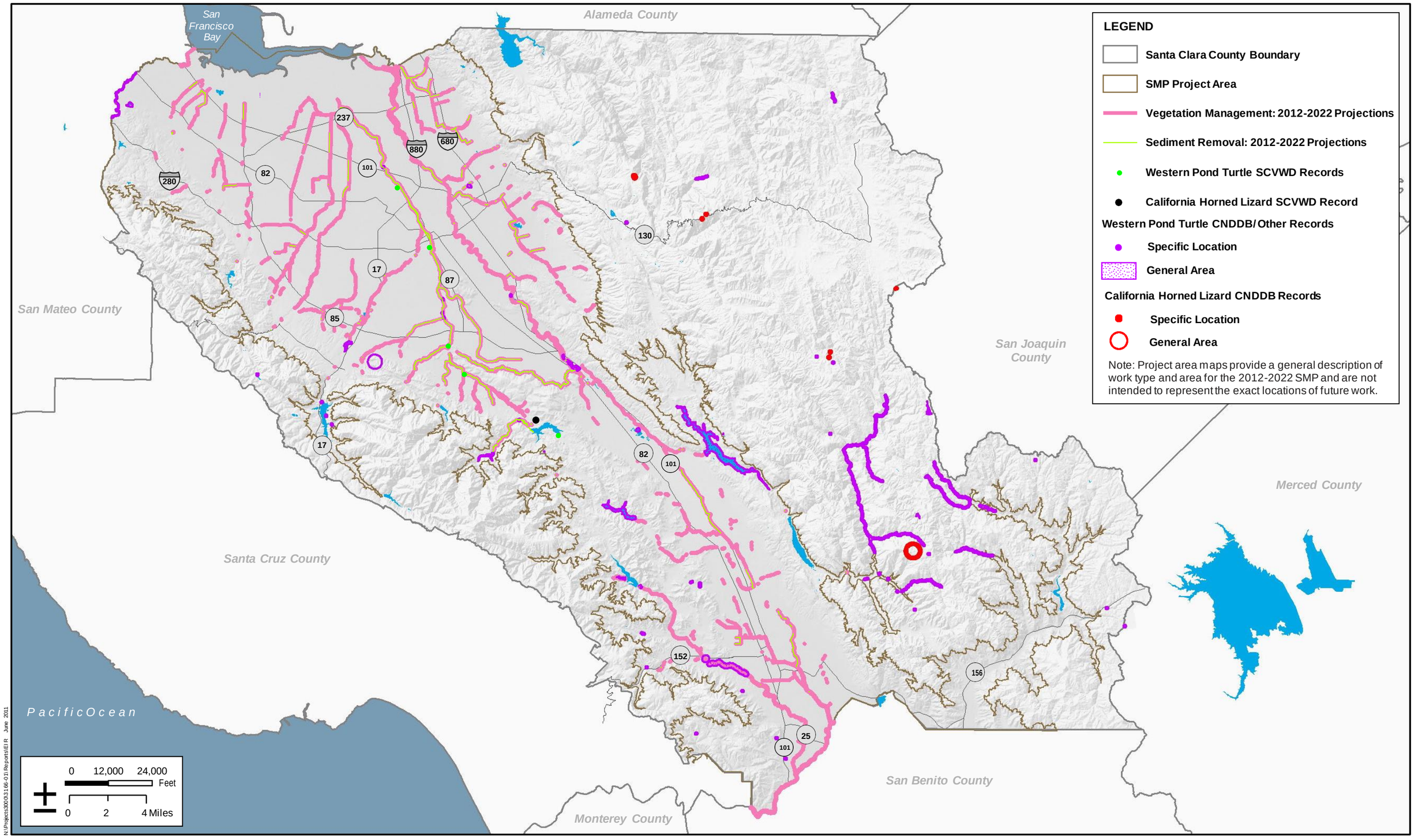

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Figure 3.3-19: Western Pond Turtle and California Horned Lizard CNDDB Occurrences in Santa Clara County

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harvester ants, and the introduction of non-native or invasive plants that would degrade habitat quality may affect the species after maintenance activities were complete. However, the likelihood of such impacts would be extremely low because suitable habitat in the Project Area primarily occurs in uplands in less developed areas outside of stream maintenance work sites (with much more limited habitat in clearings within riparian areas). Furthermore, populations of the California horned lizard in the Project Area are limited in number and extent, and few individuals likely would be present. This species occurs much more commonly just to the east in the interior of the Diablo Range, but only very sparingly on the fringes of the Project Area itself. Therefore, the Proposed Project would not have a substantial effect on regional populations of the species (which would include those in the Diablo Range).

SCVWD would implement the following BMPs, to limit the area of disturbance and to protect special-status reptiles such as the California horned lizard. A description of each BMP is provided in Table 2-12.

Applicable Best Management Practices

BMP GEN-4: Minimize the Area of Disturbance
BMP GEN-12: Protection of Special-Status Amphibian and Reptile Species

Conclusion

Implementation of these BMPs would be adequate to assure the potential impact to the California horned lizard would be less-than-significant. No mitigation would be required.

Impact BIO-18: Impacts on the Black Skimmer (Significance Criteria A, B, and E; Less than Significant)

The black skimmer (a California species of special concern) is associated with saline-managed pond habitats, which occur only in the northernmost portion of the Project Area. Black skimmers nest on small islands within managed ponds; this nesting habitat is ephemeral and thus is not mapped. Sediment management activities under the Proposed Project would not directly affect black skimmer nesting habitat. Similarly, proposed vegetation management activities are not expected to occur in suitable nesting habitat that currently exists, nor are vegetation management activities proposed in areas that are likely to be converted to suitable nesting habitat for this species in the next 10 years. Although herbicide application and mowing is projected to occur along levees adjacent to breeding habitat, because these activities would not occur in the managed pond habitat itself and would be of short duration in any specific area, they are not expected to disturb nesting skimmers to the point of nest abandonment.

The only activities with some potential to affect nesting black skimmers would be minor maintenance activities. Although these activities are not projected, some road grading (e.g., along levee roads around saline managed ponds) or removal of sediment or debris at flap gates possibly could occur near nesting sites for this species. Thus, some potential would exist for minor maintenance activities to disturb nesting skimmers, possibly to the point of abandonment of eggs or young.

Conclusion

SCVWD would implement BMP GEN-6 (*Minimize Impacts to Nesting Birds via Site Assessments and Avoidance Measures*) to minimize the potential for Proposed Project activities to impact nesting birds. With implementation of this BMP, no disturbance of nesting black skimmers is expected to occur. Therefore, the impact to this species would be less than significant, and no mitigation would be required.

Impact BIO-19: Impacts on the Western Snowy Plover (Significance Criteria A, B, and E; Less than Significant)

The western snowy plover (federally listed as threatened and a California species of special concern) is associated with non-tidal saline managed pond and salt panne habitats, which occur only in the northernmost portion of the Project Area. Figure 3.3-20 depicts the locations of potential (or recent) western snowy plover breeding habitat in the Project vicinity.

No sediment removal is projected to occur in western snowy plover habitat. Similarly, vegetation management activities are not projected to occur in currently suitable nesting habitat or in areas that are likely to be converted to suitable nesting habitat for these species in the next 10 years. Although herbicide application and mowing are projected to occur along levees, these activities would occur along outboard levees (i.e., those along sloughs) that would not be used for nesting by snowy plovers in the Project Area.

Although no activities are projected in or adjacent to habitat that is currently used by nesting snowy plovers, some potential would exist for Proposed Project activities to disturb nesting plovers. This species can select breeding areas opportunistically, and possible changes in habitat from 2012–2022 could result in use of new areas by breeding plovers. For example, if management of ponds adjacent to projected activities (such as Pond A4 between Moffett Channel and Guadalupe Slough, or Pond A18 adjacent to South Coyote Slough) changed so that these ponds became suitable for nesting, then plovers may nest in areas adjacent to projected activities. Minor maintenance road work and sediment/debris removal at flap gates, which are not projected activities, would occur in bayfront areas, and such activities potentially could occur along levees near breeding plovers. Sediment reuse, such as sediment disposal at the edges of managed ponds to provide upland transition zones for future tidal restoration, also may occur at the edges of ponds where snowy plovers could breed. Likewise, if activities such as vegetation management or management of animal conflicts needed to occur in non-projected areas, such as segments of Alviso Slough along Pond A12, then Proposed Project activities could occur adjacent to snowy plover nesting and foraging habitat. Even in such cases, Proposed Project activities are not expected to alter directly snowy plover breeding habitat, and no long-term impacts from any Proposed Project activities would occur on snowy plovers.

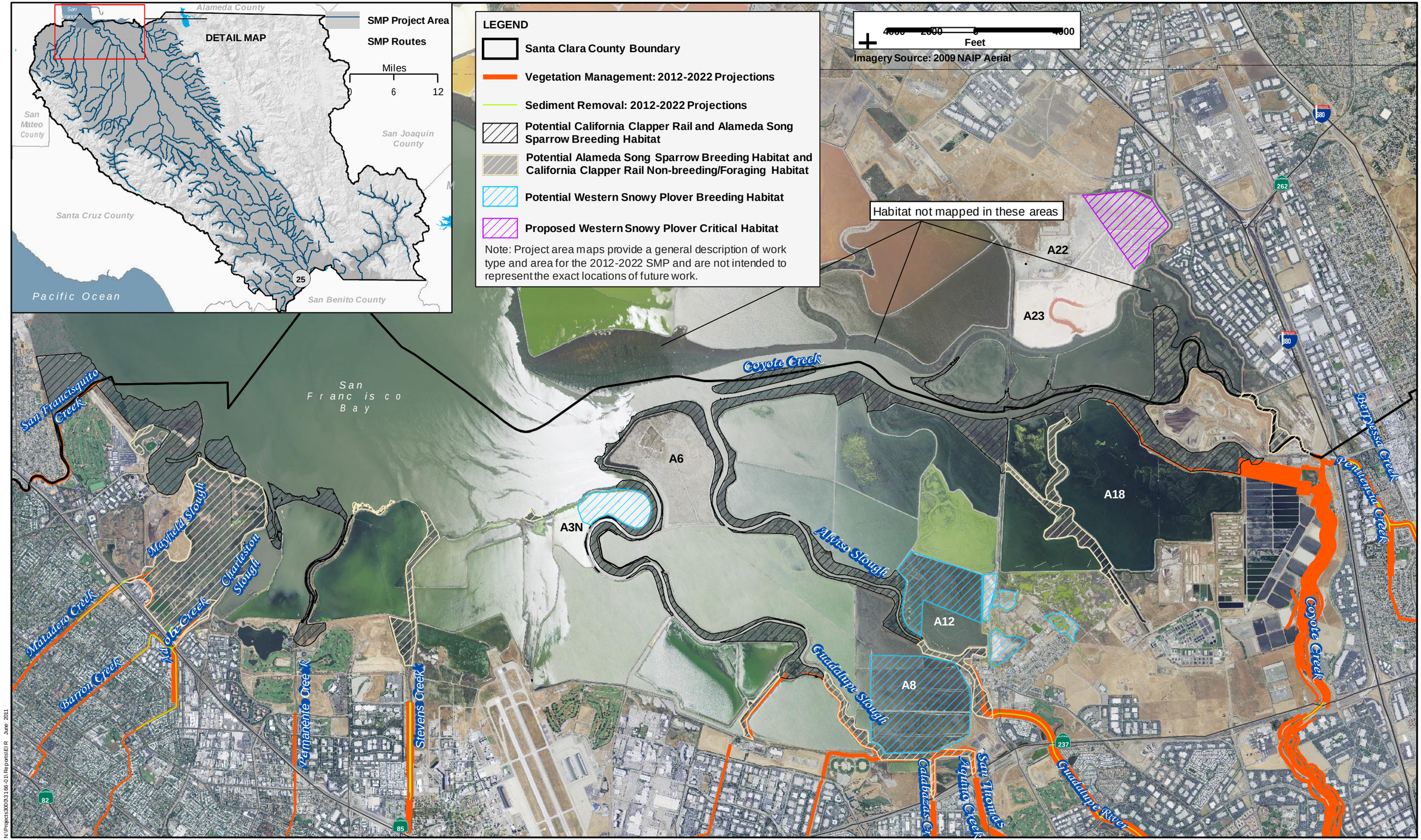

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Figure 3.3-20: Western Snowy Plover, California Clapper Rail, and Alameda Song Sparrow Habitat in Santa Clara County

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However, as described under *Determination of Impacts to Wildlife and Fisheries*, snowy plovers could be disturbed by human activity and movement of equipment from the activities described in the previous paragraph. If such disturbance occurred during the breeding season in close proximity to nesting plovers, abandonment of eggs or chicks could occur, or adults could spend enough time off the nest that eggs could be lost to exposure. Distraction of adults by Proposed Project-related disturbance also could increase the potential for predators to take young or eggs. SMP Update-related disturbance during the non-breeding season could result in temporary avoidance of foraging habitat near the projected activity by plovers, but this impact would be of very short duration.

Conclusion

SCVWD will implement BMP GEN-6 (*Minimize Impacts to Nesting Birds via Site Assessments and Avoidance Measures*) to minimize the potential for Proposed Project activities to impact nesting birds. With implementation of this BMP, no disturbance of nesting snowy plovers is expected to occur. Therefore, the impact to this species would be less than significant, and no mitigation would be required.

Impact BIO-20: Impacts on the California Clapper Rail and Alameda Song Sparrow (Significance Criteria A, B, and E; Less than Significant with Mitigation)

The California clapper rail (federally and state listed as endangered and a state fully protected species) and Alameda song sparrow (a California species of special concern) are similarly associated with salt marsh habitats, and both are known to breed in the Project Area. Thus, these species were assessed together because the potential impacts of the Proposed Project on them would be similar.

Figure 3.3-20 depicts the locations of potential California clapper rail breeding habitat in the Project Area; this mapping is based on known occurrences of clapper rails and characteristics (such as plant species composition and marsh width) of the tidal marshes. The distribution of Alameda song sparrows likely extends farther upstream, primarily because this species will breed in narrower strips of marsh such as those found upstream from some of the broader marsh patches, shown in Figure 3.3-20 as potential clapper rail breeding habitat.

Very little potential would exist for bank stabilization activities to impact California clapper rails and Alameda song sparrows because bank stabilization would be unlikely to be needed in and near the tidal salt and brackish marsh habitats in which these species occur. However, bank stabilization possibly could be needed around artificial structures, such as bridges or culverts, in and near tidal habitats. In-kind bank repairs have occurred in the past on the outboard sides of levees near potential clapper rail habitat. In addition, minor maintenance activities such as flap gate repair, removal of sediment and debris from flap gates, and levee road maintenance occasionally has been necessary in areas near clapper rail habitat. Increased human activity may affect the behavior of the clapper rails and song sparrows, causing them to avoid work sites and possibly exposing them to increased competition with conspecifics in the areas to which they dispersed and to increased levels of predation caused by unfamiliarity with the new area.

Clapper rail reactions to disturbance may vary with the seasons; however, both breeding and non-breeding seasons would be equally critical. Clapper rail mortality is greatest during the winter, primarily because of predation during extreme winter high tides (Eddleman 1989, Albertson 1995). Human-related disturbance may increase the clapper rails' vulnerability to predators. During high tides, clapper rails and other wildlife hide within any available cover in the transition zone and high marsh. As people approach, the birds may flush and attract predators. The presence of people in or near the high marsh plain or upland areas during marsh inundation may even prevent clapper rails from leaving the lower marsh plain to seek cover, which also leaves them vulnerable to predation (Evens and Page 1983, Evens and Page 1986). Disturbance caused by Proposed Project activities in close proximity to clapper rail or Alameda song sparrow habitat during the breeding season could potentially result in the abandonment of nests, eggs, and young.

Neither sediment removal activities nor instream herbicide treatment are projected to occur within suitable breeding habitat for these species. Although clapper rails occasionally may wander upstream along tidal sloughs from their typical salt marsh habitats into tidal brackish/freshwater marsh habitats, they are expected to do so rarely. California clapper rails would not breed in these areas, and song sparrows breeding upstream as far as where sediment removal activities would occur (e.g., along the lower Guadalupe River from Gold Street upstream, and along lower Penitencia Creek upstream from Interstate 880) would be more likely to be of the non-special-status subspecies *gouldii*, or intergrades between *gouldii* and *pusillula*, rather than being Alameda song sparrows. Thus, any sediment removal activities in these areas would not affect breeding habitat or breeding individuals, and would affect only habitat that was used occasionally as foraging habitat by wandering individuals. However, sediment that was removed from other locations potentially could be reused in areas close to clapper rail and song sparrow habitat. Such activities could result in disturbance to individuals, similar to that described above.

Non-instream herbicide application, hand removal of instream vegetation, and mowing are projected to occur along approximately 2.96 miles (taking "work area percentage" into account) of levee adjacent to suitable breeding habitat for the California clapper rail and Alameda song sparrow, including along South Coyote Slough, at the confluence of Guadalupe Slough and Moffett Channel, and near the mouth of San Francisquito Creek. These locations are shown in Figure 3.3-20. Because such vegetation management would be limited to the tops and sides of the levees, potentially extending downslope into bank/bench areas, this activity is not expected to result in the loss of nesting habitat. However, activities resulting in a substantial increase in noise, movement of equipment, or human presence near active nests could result in the abandonment of nests, and possibly the loss of eggs or young as a result. These vegetation management activities are also projected to occur along approximately 3.47 miles (again, accounting for work area percentage) adjacent to potential foraging (but non-breeding) habitat for the California clapper rail and nesting habitat for the Alameda song sparrow along upper Alviso Slough and Guadalupe Slough (Figure 3.3-20).

In addition, removal of vegetation from the sides of levees adjacent to clapper rail and song sparrow habitat, and particularly from lower portions of banks and benches, would reduce the amount of vegetative cover that may be used to conceal individuals from predators during high tides, especially during the winter. Thus, vegetation management activities

that would temporarily remove this habitat (e.g., herbicide application on the outboard levee of the San Francisquito Creek or Coyote Slough) would result in an adverse impact to these species. SCVWD has projected removal of such vegetation from approximately 5 percent of the portion of San Francisquito Creek adjacent to suitable habitat, 30 percent of Coyote Slough/Coyote Creek, 10 percent of Alviso Slough, and 20 percent of Guadalupe Slough.

SCVWD would implement several BMPs to address the impact of maintenance activities on the California clapper rail and Alameda song sparrow, including implementation of BMPs specifically designed to protect the California clapper rail. These BMPs would avoid or minimize impacts to these species through the identification and avoidance of occupied nesting habitat, where practicable, and the use of biological monitors where suitable habitat could not be avoided. These BMPs are as follows, and a description of each is provided in Table 2-12.

Applicable Best Management Practices

BMP GEN-4: Minimize the Area of Disturbance
BMP GEN-6: Minimize Impacts to Nesting Birds via Site Assessments and Avoidance Measures
BMP GEN-8: Protection of Sensitive Fauna Species from Herbicide Use
BMP GEN-11: Protection of Salt Marsh Harvest Mouse and California Clapper Rail
ANI-2: Prevent Harm to the Salt Marsh Harvest Mouse and California Clapper Rail

Conclusion

Implementation of these BMPs would reduce impacts on the California clapper rail and Alameda song sparrow. However, residual impacts to these species' habitats, particularly in upland transitional areas, would remain. For California clapper rails, this impact would be potentially significant because populations of the species and suitable habitat are limited locally and regionally, and loss of active nests may have a substantial effect on local and regional populations (Significance Criteria A, B, and E). For the Alameda song sparrow, this impact would be potentially significant because a relatively large number of breeding birds could be affected, resulting in a substantial effect on local and regional populations (Significance Criteria A, B, and E). Mitigation Measure BIO-1 would be implemented to reduce the impact to a less-than-significant level.

Mitigation Measure BIO-1 includes mitigation for impacts to tidal habitats and tidal marsh species. As mitigation for impacts to tidal habitats and tidal marsh species was predicted to result from the 2002–2012 SMP, SCVWD restored the "Island Ponds" (Ponds A19, A20, and A21), located between Coyote Slough and Mud Slough near Alviso, to tidal action. Monitoring has documented the formation of nascent tidal marsh habitat, including extensive channel networks, within these ponds. Thirty acres of tidal restoration within the Island Ponds was intended to serve as mitigation for impacts to tidal habitats for the 2002–2012 SMP. However, based on the actual impacts from 2002–2012 SMP activities, only 9 acres of tidal mitigation was needed to compensate for those impacts. ~~Furthermore~~As a result, SCVWD created 21 acres of ~~excess~~ tidal habitats beyond what was needed to mitigate for the actual impacts from 2002–2012 SMP activities. SCVWD would use the 21 acres of ~~excess~~ tidal marsh restoration as available mitigation for impacts to tidal wetlands and aquatic habitats, as well as tidal marsh species, under the 2012–2022

SMP Update. Physical breaching of the Island Pond levees and other physical work required for this tidal restoration has already occurred, and no further activities (other than continued monitoring of marsh development per the 2002–2012 SMP monitoring requirements) are proposed by SCVWD. This mitigation would compensate for all impacts of Proposed Project activities on these two species, by restoring extensive vegetated tidal marsh that would provide breeding and foraging habitat for these species, thereby ensuring that the SMP Update does not substantially reduce the number or restrict the range of these species, have a substantial adverse effect on these special-status species, or impede the use of their nursery sites. It is possible that this mitigation may be refined by the USFWS during Section 7 consultation (e.g., in a Biological Opinion), or by the CDFG during CESA consultation, in which case the refined mitigation measure would be implemented.

Mitigation Measure BIO-1 would be implemented to compensate for all impacts on the California clapper rail and Alameda song sparrow to a less-than-significant level.

Impact BIO-21: Impacts on the California Black Rail and Bryant's Savannah Sparrow (Significance Criteria A, B, and E; Less than Significant)

The California black rail (state listed as threatened and a fully protected species) and Bryant's savannah sparrow (a California species of special concern) are similarly associated with salt marsh habitats in the Project Area, and were assessed together because the potential impacts of the Proposed Project on them would be similar.

Bryant's savannah sparrow is known to breed in the Project Area in tidal salt marsh and brackish marsh habitats, diked and muted tidal salt marsh habitats, and (in very limited numbers) inland grasslands. The California black rail is not known or expected to breed in the Project Area, and it occurs only as a rare winter visitor to tidal salt marshes along the edge of the South Bay.

As discussed under *Determination of Impacts to Wildlife and Fisheries*, proposed maintenance activities may result in direct and indirect impacts on these species. However, neither sediment removal activities nor instream herbicide treatment are projected to occur within suitable habitat, as sediment removal would not extend downstream to tidal salt marshes used by them.

Vegetation management activities are proposed in areas in and adjacent to suitable breeding habitat for Bryant's savannah sparrow, including along Coyote Slough and the Coyote Creek Bypass, Lower San Francisquito Creek, and possibly Guadalupe Slough and Alviso Slough. Because Bryant's savannah sparrows may nest in vegetation along the sides of these levees, these activities would have the potential to disturb nesting birds, and nests placed on the ground within vegetation on levees could be destroyed during vegetation management and inspection activities. Both Bryant's savannah sparrows and black rails use vegetation along the toe of the levee slope for cover, especially during very high winter tides that inundate the rest of the marsh plain. As a result, vegetation removal along these levees would reduce cover for foraging and non-breeding individuals during high winter tides. Vegetation management activities are projected to occur along only approximately 5 percent of the portion of San Francisquito Creek adjacent to suitable breeding habitat, 30 percent of Coyote Slough/Coyote Creek, 10 percent of Alviso Slough, and 20 percent of

Guadalupe Slough. Because the majority of vegetation in these areas would not be affected by vegetation management, and because known wintering populations of black rails in the South Bay are apparently very small (with no records from the majority of the areas where vegetation management would occur), sufficient cover would be present along those levees to continue to provide wintering habitat and high-tide refugia for these species. In addition, because the abundance of Bryant's savannah sparrows nesting on levees (as opposed to high-marsh areas) within these sloughs is fairly low, the number of savannah sparrow nests that could be impacted by these activities would be low relative to regional populations. Thus, projected vegetation management would not result in a substantial impact to regional populations of Bryant's savannah sparrows.

In-kind bank repairs have occurred in the past on the outboard sides of levees near potential Bryant's savannah sparrow nesting habitat and California black rail foraging habitat. In addition, minor maintenance activities such as flap gate repair, removal of sediment and debris from flap gates, and levee road maintenance occasionally has been necessary in areas near habitat for these two species. Effects of proposed activities would be similar to those of vegetation management, but would be more limited because of the limited extent of such activities expected to occur in or near habitat of these species.

Vegetation management along levees may actually benefit Bryant's savannah sparrows, by helping them to maintain suitable nesting habitat. If this activity were to cease, vegetation along the levees would increase in height and density to the point where it no longer would provide suitable breeding habitat. In addition, much of the vegetation management that would take place in salt marsh habitats would consist of invasive species management in the Coyote Bypass area, which would benefit the savannah sparrow. Thus, vegetation management would provide a long-term benefit to this species.

SCVWD would implement several BMPs that would reduce the impact of maintenance activities on the California black rail and Bryant's savannah sparrow. SCVWD would implement BMP GEN-6 (*Minimize Impacts to Nesting Birds via Site Assessments and Avoidance Measures*) to minimize the potential for Proposed Project activities to impact nesting birds, which would minimize impacts to nesting savannah sparrows. Several other BMPs are specific to the salt marsh harvest mouse and California clapper rail, but they also would help to minimize potential impacts to the California black rail and Bryant's savannah sparrow. These BMPs are as follows, and a description of each is provided in Table 2-12.

Applicable Best Management Practices

BMP GEN-4: Minimize the Area of Disturbance
BMP GEN-6: Minimize Impacts to Nesting Birds via Site Assessments and Avoidance Measures
BMP GEN-8: Protection of Sensitive Fauna Species from Herbicide Use
BMP GEN-11: Protection of Salt Marsh Harvest Mouse and California Clapper Rail
ANI-2: Prevent Harm to the Salt Marsh Harvest Mouse and California Clapper Rail

Conclusion

Implementation of these BMPs would be adequate to assure that the impact of Proposed Project activities on the Bryant's savannah sparrow and California black rail would be less than significant, and no mitigation would be required. Although no mitigation for impacts to these species would be necessary, implementation of the tidal mitigation component of Mitigation Measure BIO-1 would benefit these species by restoring breeding habitat for Bryant's savannah sparrow and wintering/foraging habitat for both species.

Impact BIO-22: Impacts on the San Francisco Common Yellowthroat (Significance Criteria A, B, and E; Less than Significant)

The San Francisco common yellowthroat (a California species of special concern) is a fairly common breeder in fresh and brackish marshes in the northern part of the Project Area. It is known to breed in tidal salt and brackish marshes near the edge of the South Bay, as well as in herbaceous riparian habitat and ruderal floodplain habitat along streams entering the Bay, such as lower Coyote Creek and the Guadalupe River (Bousman 2007m). Proposed sediment removal activities would have the potential to affect the habitat in numerous areas where the San Francisco common yellowthroat is known to breed. Thus, as discussed under *Determination of Impacts to Wildlife and Fisheries*, proposed maintenance activities may result in direct and indirect impacts on this species.

Suitable habitat for San Francisco common yellowthroats may be temporarily lost as a result of sediment management activities and instream herbicide application, especially in areas on the Guadalupe River from Gold Street in Alviso upstream to U.S. Highway 101, and to a lesser extent in areas along Lower Coyote Creek, Coyote Slough, San Tomas Aquino Creek, and Lower Calabazas Creek downstream of Tasman Drive. Non-instream herbicide application also could result in the loss of nesting habitat (i.e., on levee slopes) and foraging habitat, particularly along Alviso Slough, Guadalupe Slough, and the Lower Sunnyvale West Channel. Herbicide application in the Coyote Bypass potentially could affect this species' habitat by addressing the invasive perennial peppergrass, which San Francisco common yellowthroats use for nesting. Although sediment removal would result in a temporary loss of breeding habitat for the San Francisco common yellowthroat, as discussed above, SCVWD studies have found that wetland vegetation often quickly re-establishes following sediment removal activities; therefore, the impact would be of short duration (i.e., 2–3 years). Although frequent, repetitive sediment removal or vegetation management would result in a long-term reduction of habitat for this species, less frequent, though periodic, sediment removal and herbicide application in freshwater marsh habitat would prevent succession that would ultimately convert high-quality nesting habitat provided by emergent vegetation to taller, woody riparian habitat, which would provide lower-quality breeding habitat. Therefore, Proposed Project activities would help to maintain extensive high-quality habitat for San Francisco common yellowthroats in the long term, at the expense of 2–3 years of habitat loss immediately following sediment removal.

Impacts to San Francisco common yellowthroats and their habitat also may occur because of unprojected activities, such as bank stabilization, management of animal conflicts, and minor maintenance. In particular, if bank stabilization activities replaced existing breeding habitat with hardscape, then breeding habitat could be lost permanently. However, such activities are expected to occur only in small, very localized areas. Thus, the amount of habitat lost as a result of bank stabilization would not result in a substantial effect on regional populations of this species.

Individual San Francisco common yellowthroats (especially eggs or young in nests) may be killed or injured during sediment removal activities, crushed by construction personnel or equipment. In addition, activities causing a substantial increase in noise, movement of equipment, or human presence near active nests may result in nest abandonment, and possibly the loss of eggs or young as a result. Because of the large numbers of individuals and active nests of this species occurring at work sites, such activities could have a substantial impact on regional populations in the absence of BMPs.

To reduce these impacts, SCVWD would implement the following BMPs. A description of each BMP is provided in Table 2-12.

Applicable Best Management Practices

BMP GEN-4: Minimize the Area of Disturbance
BMP GEN-6: Minimize Impacts to Nesting Birds via Site Assessments and Avoidance Measures
BMP GEN-8: Protection of Sensitive Fauna Species from Herbicide Use

Conclusion

Implementation of these BMPs would be adequate to assure that the impact of Proposed Project activities on the San Francisco common yellowthroat would be less than significant, and no mitigation would be required.

Although no mitigation for impacts to this species would be necessary, several mitigation measures for other impacts would benefit this species. As discussed under Impacts BIO-1 and BIO-2, Mitigation Measure BIO-1 and Mitigation Measure BIO-2 would require SCVWD to provide compensatory mitigation for impacts to wetland, aquatic, and riparian habitats. This mitigation may take a variety of forms, and such mitigation would benefit the San Francisco common yellowthroat only if wetland and riparian restoration were to occur within this subspecies' limited range. Nevertheless, wetland and riparian mitigation within this subspecies' range would provide breeding and foraging habitat for the species. Implementation of the tidal mitigation component of Mitigation Measure BIO-1 would provide wintering habitat, and possible breeding habitat as well, for the San Francisco common yellowthroat.

Impact BIO-23: Impacts on the Least Bell's Vireo (Significance Criteria A, B, and E; Less than Significant with Mitigation)

The least Bell's vireo (federally and state-listed as endangered) was thought to have been extirpated from northern California by 1970, but in the past two decades, populations have begun to rebound because of intensive recovery efforts (Kus 2002, USFWS 2006). However, only three records have been made in Santa Clara County since 1932. Two were from lower Llagas Creek between Highway 152 and the confluence with the Pajaro River, just east of Gilroy; one of these records, made in 1997, pertains to a nesting pair. A third record was from Coyote Creek near the Coyote Creek Golf Course (H. T. Harvey & Associates, unpublished).

Least Bell's vireo numbers may increase in number and distribution as the core populations increase, but it is unlikely to be ever more than a rare and very locally occurring breeder along South County streams, because of its limited historical distribution in the County and the abundance of brood parasitic brown-headed cowbirds (*Molothrus ater*). It is a riparian-obligate breeder (Kus 1998), nesting in dense thickets of willows and other low bushes along perennial or ephemeral streams (Franzreb et al. 1994, Kus 2002).

The Proposed Project may affect suitable habitat (breeding or foraging) for the least Bell's vireo and/or individuals (e.g., disturbance of active nests during maintenance activities). As discussed under *Determination of Impacts to Wildlife and Fisheries*, proposed maintenance activities may result in direct and indirect impacts on the least Bell's vireo. Potential effects would include injury or mortality of individuals (especially eggs or young in nests) as a result of equipment, vehicle traffic, and worker foot traffic; nests typically are built only a few feet off the ground, and thus maintenance personnel could impact nests directly while moving through vegetation. Individuals and their nests also could be disturbed by substantial increases in noise and human disturbance, and increases in native and non-native predators. Human disturbance, leading to reduced attendance of nests, could potentially increase the risk of brood parasitism by brown-headed cowbirds.

Based on past work records, SCVWD stabilizes less than 0.25 mile of stream bank per year throughout the Pajaro River Basin, only a small portion of which is suitable habitat for the least Bell's vireo. Because of the very limited extent of bank stabilization activities expected in the Pajaro River Basin and the very localized, sporadic nature of occurrence of least Bell's vireo, a low probability would exist for the species to be impacted by bank stabilization activities. Nevertheless, SCVWD would implement BMP GEN-6 to avoid impacts of Proposed Project activities to nesting birds.

Sediment removal activities are not proposed within areas of suitable habitat for the least Bell's vireo (i.e., along the Pajaro River, Llagas Creek south of Highway 152, and Uvas/Carnadero creeks on the valley floor), except within a 300-foot reach of Llagas Creek around stream gauge 5085, where 0.78 acres of sediment removal is projected to occur. This activity would take place on the proposed reach no more than twice during the 10-year Proposed Project span. Sediment removal activity in this reach could result in effects on the least Bell's vireo, similar to those described above, if vireos were actively nesting when sediment removal occurred. Sediment removal also could result in impacts to a small

amount of potential nesting and foraging habitat, for access to the stream gauge and movement of equipment during sediment removal.

Instream vegetation management is proposed to occur on Llagas Creek and lower Uvas/Carnadero Creek, in suitable habitat for the least Bell's vireo. This effect would occur infrequently on any proposed reach (not more than three times during the 10-year Proposed Project span), and would impact a maximum of 10 percent of any specific reach.

Non-instream herbicide application along the upper (levee top) and lower maintenance roads of lower Llagas Creek also is proposed in areas of suitable habitat for the least Bell's vireo. Hand removal of vegetation, mowing, and herbicide application are projected to affect a large portion of the suitable habitat along the creek (e.g., if the target vegetation types were present, herbicide application could potentially occur along 100 percent of the bank/bench from the Pajaro River confluence to Highway 152, on both sides of the creek). Upland vegetation adjacent to riparian habitats is frequently used for foraging, and sometimes nesting, by least Bell's vireos (USFWS 1998b), and the pair that attempted nesting in 1997 along lower Llagas Creek was frequently seen in tall, weedy vegetation on the bank and bench outside of the willow riparian corridor (S. Rottenborn, pers. obs.). Thus, increased noise, movement of equipment, or human presence in this habitat could result in the abandonment of a territory by a pair of least Bell's vireos attempting to nest, or preclude the use of habitat along lower Llagas Creek by a pair of vireos that would have otherwise attempted nesting. Herbicide application is not expected to impair the health of any individual vireos.

Because non-instream herbicide application could potentially occur twice yearly (early and late spring, thus keeping vegetation short throughout the species' breeding season), this impact would substantially reduce the area's value as foraging habitat for the least Bell's vireo by removing shrubs and tall forbs from the upper (levee top) and lower maintenance roads along lower Llagas Creek. The frequency with which this vegetation management would occur would result in longer-term effects.

Although non-instream vegetation management (hand removal of vegetation, mowing, and herbicide application) also is proposed along the Pajaro River and the lower Uvas/Carnadero Creek in areas of suitable habitat for the least Bell's vireo, each type of activity would take place on a specific reach no more than twice during the 10-year Proposed Project span and would affect a maximum of 2 percent of the reach. As a result, effects of such non-instream vegetation management along the Pajaro River and Uvas/Carnadero Creek on potential least Bell's vireo habitat would be minimal.

Collectively, projected 2012–2022 vegetation management activities would affect a total of 19.09 acres in instream and bank/bench areas along reaches of creek that could potentially support nesting least Bell's vireos (i.e., along lower Llagas Creek downstream from Highway 152, the Pajaro River from Llagas Creek downstream, and lower Uvas/Carnadeo Creek downstream from Hecker Pass Road).

SCVWD would implement the following BMPs to reduce impacts to least Bell's vireos. A description of each BMP is provided in Table 2-12.

Applicable Best Management Practices

~~BMP GEN-4: Minimize the Area of Disturbance~~
~~BMP GEN-6: Minimize Impacts to Nesting Birds via Site Assessments and Avoidance Measures~~
BMP GEN-6.5: Protection of Nesting Least Bell's Vireos

Conclusion

These BMPs would reduce impacts, but residual impacts would remain if occupied habitat of least Bell's vireo was removed, or if Proposed Project activities along lower Llagas Creek modified habitat to the point of precluding nesting by least Bell's vireos that would otherwise have occurred. Because of the irregular nature of occurrence by the species along lower Llagas Creek, and because the species has not been recorded there since 2001, it is impossible to determine the extent to which Proposed Project activities could be expected to impact the species' populations or their use of habitat in the Project Area. Nevertheless, the Proposed Project would result in the loss of multi-layered willow riparian habitat and adjacent weedy edges used for nesting and foraging. Because of the extreme rarity of this species in the region, any impact on individuals of this species would be significant (Significance Criterion A), and any impacts to habitat that reduced the use of the Project Area by the species also would be significant (Significance Criteria A, B, and E).

As discussed under Impact BIO-2, Mitigation Measure BIO-2 would require SCVWD to provide compensatory mitigation for impacts to riparian habitats. This mitigation may take a variety of forms, and such mitigation would benefit the least Bell's vireo only if riparian mitigation were to occur within this species' limited range. Therefore, Mitigation Measure BIO-12 would be implemented to reduce the impact to the least Bell's vireo to a less-than-significant level.

Mitigation Measure BIO-12: Implement Compensatory Mitigation for the Least Bell's Vireo

One of the following two measures will be implemented so that adequate willow-dominated riparian habitat with adjacent shrubs and tall forbs is maintained in extreme southern Santa Clara County, in light of proposed activities, to provide potential nesting habitat for least Bell's vireos. Simultaneous with (i.e., within the same maintenance year as) performance of SMP activities that adversely affect least Bell's vireo habitat, the SCVWD will make the decision as to which of these measures will be applied.

- Mitigation Measure BIO-12A: The projected vegetation management regime for lower Llagas Creek, from Southside Drive downstream to the confluence with the Pajaro River, will be modified so that vegetation management in any specific area will occur no more frequently than every 3 years to allow for the regrowth of shrubs and taller forbs, which will provide foraging habitat for least Bell's vireos and other riparian birds. The levee tops and lower maintenance roads will be excluded from this requirement (i.e., vegetation management can occur on the levee tops and lower maintenance roads as needed), but no other vegetation management will occur more frequently than every 3 years. Furthermore, in any specific year, vegetation management will occur along no more than half (measured longitudinally along the creek) of the reach of lower Llagas Creek downstream from Southside Drive. This will assure that at any specific time, at

least half of this reach will support vegetation that has not been managed (with the exception of levee top roads and lower maintenance roads) for at least 3 years, thus providing ample suitable nesting and foraging habitat for the low-level, irregular use of this reach by Bell's vireos that occurs. These limitations may need to be adapted if they do not maintain sufficient tall, weedy habitat along the edges of the woody riparian corridor to provide suitable least Bell's vireo foraging habitat, or if they produce abnormally dense, stunted growth of willows that is not suitable for use by nesting vireos. This measure is preferred by the District over Mitigation Measure 12B. However, if this measure cannot be implemented feasibly, or if SCVWD elects not to implement this measure, Mitigation Measure BIO-12B will be implemented.

- Mitigation Measure BIO-12B: SCVWD will create or restore conditions similar to those currently present along lower Llagas Creek by acquiring land, an easement on land, or permission from landowners along the Pajaro River, or along Carnadero Creek downstream from Highway 25, and managing a strip 50 feet wide outside of the woody riparian canopy so that tall forbs and shrubs are able to grow. This strip will be managed so that portions of it are disturbed (via mowing or herbicide use) every 3–4 years, with no more than half disturbed in a specific year, so that early successional conditions are maintained (with the caveat that this management regime may need to be adapted, as described in the preceding paragraph, so that suitable conditions are maintained). The linear footage of habitat that will be required to be managed in this way will equal the linear footage of lower Llagas Creek (on each side of the creek, downstream from Southside Drive, that is actually subjected to the proposed non-instream vegetation management activities and not managed as described in Mitigation Measure BIO-12A. If this mitigation option is selected, the SCVWD will prepare a HMMP for the mitigation site that includes the following:
  - a summary of impacts to least Bell's vireo habitat and populations, and the proposed mitigation;
  - a description of the location and boundaries of the mitigation site and description of existing site conditions;
  - a description of measures to be undertaken if necessary to enhance (e.g., through focused management) the mitigation site for the least Bell's vireo;
  - proposed management activities to maintain high-quality habitat for least Bell's vireos;
  - a description of species monitoring measures on the mitigation site, including specific, objective goals and objectives <u>(including maintaining or restoring suitable habitat for the least Bell's vireo)</u>, performance indicators and success criteria <u>(including maintenance or improvement of habitat structure suitable for use by least Bell's vireos)</u>, monitoring methods <u>(including least Bell's vireo surveys)</u>, data analysis, reporting requirements, and monitoring schedule. Determining <u>other</u> specific performance/success criteria requires information regarding the specific mitigation site, its conditions, and the specific enhancement and management measures tailored to the mitigation site and its conditions.

As a result, additional ~~those~~ specific criteria will be defined in the HMMP rather than in this SEIR. Nevertheless, the performance/success criteria described in the HMMP will guide the mitigation to manage and protect habitat at least as suitable for use by the least Bell's vireo as the habitat that is impacted.

- a description of the management plan's adaptive component, including potential contingency measures for mitigation elements that do not meet performance criteria; and
- a description of the funding mechanism for the long-term maintenance and monitoring of the mitigation lands.

The HMMP will be provided to the USFWS and CDFG for review because this species is both state and federally listed. It is possible that this mitigation measure may be refined during the Section 7 consultation process with the USFWS (e.g., in the Biological Opinion covering Project effects on the least Bell's vireo) or by the CDFG during the Section 2081 consultation process (e.g., in an Incidental Take Permit), in which case the refinements required by these agencies would be implemented.

MM BIO-12 will mitigate impacts to the least Bell's vireo to less-than-significant levels by managing and protecting habitat suitable for use by this species, thereby ensuring that the SMP does not substantially reduce the number or restrict the range of this endangered species, have a substantial adverse effect on this special-status species, or impede the use of its nursery sites.

Impact BIO-24: Impacts on the Burrowing Owl (Significance Criteria A, B, and E; Less than Significant with Mitigation)

Burrowing owls occur in annual and perennial grassland habitats, typically with sparse or non-existent tree or shrub canopies. They exhibit strong site fidelity and may use a nesting site year after year. Burrowing owls in the Santa Clara Valley include both year-round residents and migrants that take up residency during the winter. They are routinely observed in open, agricultural, or grassland areas with active squirrel burrows. In the Project Area, particular concentrations of burrowing owls occur in the Alviso area at the San Jose-Santa Clara Water Pollution Control Plant (WPCP) and its buffer lands and the Santa Clara Valley Transportation Authority's Cerone operating division (adjacent to Coyote Creek), at the San Jose International Airport, and on undeveloped parcels east of U.S. Highway 101 near the airport (Figure 3.3-21). However, this species is increasingly disappearing from "infill" locations on the urban valley floor, and it has practically disappeared as a breeder from areas of the county south of northern San Jose. Burrowing owls were present in the Coyote Valley, Blossom Valley, and Evergreen areas in the 1990s, but they have been infrequently recorded in either area since that time. They are still occasionally recorded in Coyote Valley and in grasslands at higher elevations, such as on Coyote Ridge, but they seem to occur in such areas primarily during the non-breeding season.

As discussed under *Determination of Impacts to Wildlife and Fisheries*, proposed maintenance activities may result in direct and indirect impacts on this species. Impacts from the Proposed Project may affect burrowing owl habitat (nesting, foraging, or

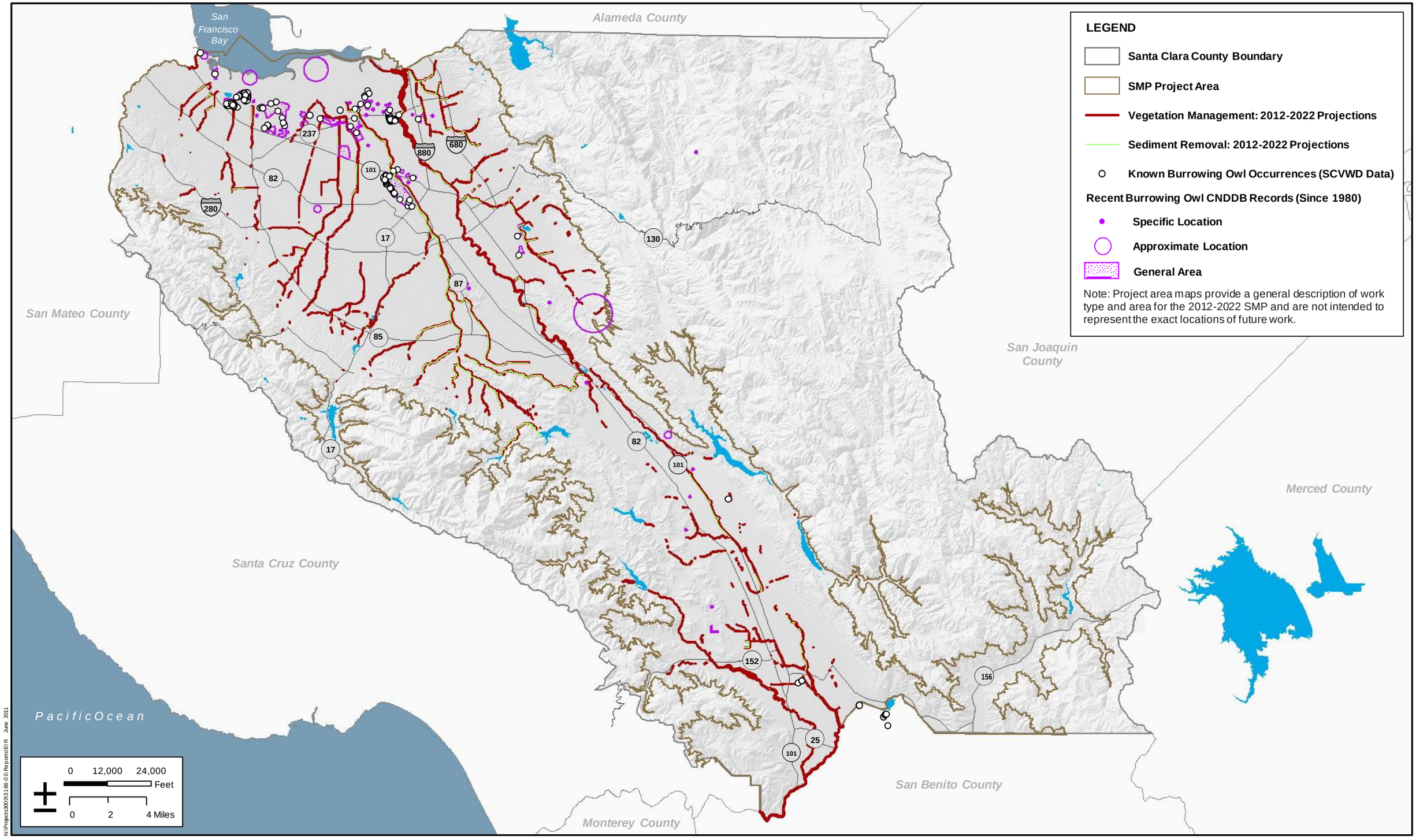

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Figure 3.3-21: Recent Burrowing Owl Records in Santa Clara County

Santa Clara Valley Water District Stream Maintenance Program EIR (3166-01)

July 2011

wintering) and/or individuals. Burrowing owls can adapt to the presence of humans and are known to nest and forage in open grassland areas adjacent to human developments. However, because they nest underground individual burrowing owls (especially young or adults in burrows) may be killed or injured during maintenance activities from trampling by construction personnel or equipment. Maintenance activities that occur in close proximity to active burrows may disturb owls to the point of abandoning their burrows, including active nests, eggs, and young. In addition, clearing and grading for access roads, staging areas, and burrow destruction and filling work could result in the direct loss of habitat or individuals through the disturbance of grassland areas that support ground squirrel burrows, and maintenance activities may result in a reduction in the quality of breeding or foraging habitat because of the introduction of non-native vegetation. Such impacts may occur because of both projected sediment removal and vegetation management activities and unprojected activities (e.g., bank stabilization, management of animal conflicts, and minor maintenance). Small mammal control would reduce the availability of burrows and prey for this species, resulting in the long-term degradation of habitat for breeding and wintering owls, to the extent that these owls use burrows in the levees that would be managed by SCVWD. Pesticides used for vegetation management or management of animal conflicts may deplete prey both within work sites and possibly adjacent areas. The use of certain rodenticides (e.g., strychnine and anticoagulants such as chlorophacinone and diphacinone) to prevent animal conflicts on levees also may result in the secondary poisoning of birds that consumed rodents or invertebrates that consumed the poison bait (USEPA 2009), and fumigants may kill any owls using burrows that were treated in this manner.

Burrowing owls seem to occur more widely in the South Bay in winter than they do during the breeding season. For example, burrowing owls occur on Coyote Ridge and in Coyote Valley during winter, but they have not been recorded lingering into spring and summer to breed in those areas in recent years. This suggests that wintering habitat for burrowing owls is not limiting the species' South Bay populations. As a result, impacts of Proposed Project activities on wintering owl habitat, including burrows that were occupied by owls only during the winter but that were not used for breeding, are not expected to affect appreciably regional populations of this species. However, as the availability of grassland habitat used for nesting in the Project Area continues to dwindle because of development, the South Bay breeding population of burrowing owls faces extirpation caused by lack of sufficient suitable nesting and breeding-season foraging habitat and isolation from other populations and habitat areas. Therefore, impacts to individual burrowing owls (at any time of year) and occupied breeding habitats resulting from the Proposed Project would contribute to the broader-scale decline in regional burrowing owl populations.

In 2007 and 2008, a habitat assessment, burrow mapping study, and standardized protocol surveys for the burrowing owl were conducted along sections of multiple SCVWD-managed waterways in Palo Alto, Mountain View, Sunnyvale, Santa Clara, San Jose, Alviso, Milpitas, and Gilroy (EDAW 2008). These surveys identified active breeding and overwintering burrowing owls at a few locations in or adjacent to the Project Area (Figure 3.3-21), and potential habitat for burrowing owls was determined to be present along a number of creeks that were surveyed in the Project Area (EDAW 2008). However, no burrowing owls were recorded using SCVWD facilities, such as levees, during either of the two surveys. Similarly, a comprehensive breeding-season survey of the most likely areas of

burrowing owl occurrence in and near the *Santa Clara Valley Habitat Plan* area in 2008 recorded no burrowing owls on SCVWD facilities (Albion Environmental 2008).

Albion Environmental (2009) assessed the potential impact of the SCVWD's proposed burrow management on burrowing owls specifically for the SMP. Because no evidence existed that SCVWD levees provided important burrowing owl nesting or roosting habitat (i.e., used regularly or by a sizeable proportion of the South Bay population), Albion Environmental concluded that management of burrows on SCVWD levees would not result in a substantial impact to burrowing owl habitat. Therefore, the actual impacts of SCVWD management of levees on burrowing owl populations is expected to be low.

Implementation of pre-project planning BMPs would reduce impacts on burrowing owls by minimizing the extent of maintenance activities. In addition, implementation of the BMP specifically designed to protect burrowing owls would avoid or minimize impacts to this species through the identification and avoidance of occupied burrows (i.e., burrows currently in use by owls, or that were used for nesting by owls within the prior 3 years [California Burrowing Owl Consortium 1993]), where feasible. Where avoidance of an occupied burrow was not feasible, the CDFG would be consulted to determine an appropriate relocation plan for individual owls (during the non-breeding season) to prevent injury or mortality of individuals These BMPs are as follows, and a description of each is provided in Table 2-12.

Applicable Best Management Practices

BMP GEN-4: Minimize the Area of Disturbance
BMP GEN-6: Minimize Impacts to Nesting Birds via Site Assessments and Avoidance Measures
BMP GEN-7: Protection of Burrowing Owls
BMP ANI-1: Avoid Redistribution of Rodenticides
BMP ANI-3: Burrowing Owl, Bald Eagle, and Golden Eagle Buffer Zone

Conclusion

Implementing these BMPs would reduce impacts on burrowing owl individuals by preventing their injury or mortality. However, residual impacts to burrowing owl habitat may occur if loss of occupied breeding habitat could not be avoided. Loss of occupied breeding habitat resulting from the Proposed Project may result in a substantial impact to regional burrowing owl populations because this species has experienced substantial regional losses in habitat and populations, and thus the impact would be significant (Significance Criteria A, B, and E). When occupied habitat must be impacted, Mitigation Measure BIO-13 would be implemented to reduce the impact to burrowing owl to a less-than-significant level.

Mitigation Measure BIO-13: Implement Compensatory Mitigation for the Burrowing Owl

If a burrow that has been used for nesting by burrowing owls within the prior 3 years cannot be avoided (e.g., an occupied burrow is located on an eroding bank that must be repaired to maintain public safety), then the CDFG will be consulted to determine an appropriate relocation plan for the owl(s) in accordance with BMP GEN-7 and habitat

compensation will be provided. If the habitat surrounding the burrow from which the owl is evicted remains suitable for use by burrowing owls following completion of the SMP activity (based on an assessment by a qualified biologist), SCVWD will have the option of either providing habitat mitigation off-site, as described below, or monitoring the work site to determine whether it is re-occupied by burrowing owls. If SCVWD documents nesting by burrowing owls within 2 years of completion of the maintenance activity in the vicinity of the impact site indicating that the activity did not have a long-term impact on the owls' use of the site, no further mitigation would be required.

If the maintenance activity will degrade habitat quality to the extent that maintaining owl use of the site is not feasible or ecologically preferable, in the opinion of a qualified SCVWD biologist, then off-site mitigation will be provided to compensate for the loss of occupied burrowing owl nesting habitat. California burrowing owl mitigation guidelines recommend that 9.75–19.5 acres of habitat be preserved and managed per occupied burrowing owl nest burrow (whether by a pair or singly) in mitigation sites (California Burrowing Owl Consortium 1993). The amount of mitigation habitat provided will depend on whether the mitigation habitat is occupied by burrowing owls (9.75 acres), adjacent to occupied habitat (13.0 acres), or suitable but unoccupied (19.5 acres). SCVWD will use these guidelines in determining the extent of mitigation habitat to be provided. The mitigation site must be located in Santa Clara County, or in areas of San Mateo or Alameda counties adjacent to San Francisco Bay, so that the mitigation supports the maintenance of South Bay burrowing owl populations.

This mitigation may be provided via the management of suitable habitat on SCVWD lands (either existing lands or lands that are acquired), purchase of credits in a mitigation bank (if one is available), or contribution of funds toward the management of the required amount of suitable habitat owned by another entity. If SCVWD provides habitat mitigation on its own lands, either on existing SCVWD lands or on lands that are acquired for mitigation purposes, an HMMP will be prepared detailing the areas to be preserved for owls; the methods for managing on-site habitat for owls and their prey (including vegetation management to maintain low-statured herbaceous vegetation); methods for enhancing burrow availability within the mitigation site (potentially including the provision of artificial burrows, although long-term management for ground squirrels will be important as well); measures to minimize adverse effects of development on owls on-site; and a monitoring program and adaptive management program. The monitoring program will include performance indicators and success criteria, including maintenance of short vegetation supporting California ground squirrels and maintenance of increase in burrowing owl numbers on the mitigation site. Determining other specific performance/success criteria requires information regarding the specific mitigation site, its conditions, and the specific enhancement and management measures tailored to the mitigation site and its conditions. For example, performance criteria for a site where burrowing owls are known to occur (including maintaining or increasing burrowing owl abundance) may differ from those for an unoccupied site adjacent to occupied burrowing owl habitat (including attracting owls to use the mitigation site). As a result, those specific criteria will be defined in the HMMP rather than in this SEIR. Nevertheless, the performance/success criteria described in the HMMP will guide the mitigation to manage and protect high-quality habitat for burrowing owls, adequate to compensate for impacts.

~~The HMMP will be submitted to the CDFG for review.~~ If a mitigation bank providing credits for burrowing owls is established within the aforementioned mitigation area (i.e., in Santa Clara County, or in areas of San Mateo or Alameda counties adjacent to San Francisco Bay), then mitigation may take the form of the purchase of credits equivalent to the number of acres of mitigation required.

MM BIO-13 will mitigate impacts to the burrowing owl to less-than-significant levels by managing and protecting habitat suitable for use by this species, thereby ensuring that the SMP does not substantially reduce the number or restrict the range of this rare species, have a substantial adverse effect on this special-status species, or impede the use of its nursery sites.

Impact BIO-25: Impacts on the Golden Eagle and Bald Eagle (Significance Criteria A, B, and E; Less than Significant)

The golden eagle (a state fully protected species) breeds in a range of open habitats, including scrub, woodlands, and grasslands. In the Project Area, nesting is expected to occur primarily in the foothills of the Diablo Range and Santa Cruz Mountains. Nesting on the valley floor occurs more rarely, although a pair has nested on an electrical tower below Calero Reservoir for a number of years and another pair has nested in a residential backyard in western Morgan Hill (S. Rottenborn, pers. obs.). These individuals, as well as low numbers of other non-breeding golden eagles, forage regularly in large open habitat areas within the Project Area, but generally on the periphery where larger areas of natural habitat occur adjacent to much larger expanses of open habitat.

The bald eagle (state listed as endangered and a state fully protected species) is only known to nest in Santa Clara County in four locations—in gray pines at Coyote Reservoir and Anderson Reservoir at the eastern edge of the Project Area, on an electrical transmission tower near Calaveras Reservoir just outside the Project Area, and near San Felipe Lake along Highway 152 (Bousman 2007e). Small numbers also occur as non-breeding visitors, typically at reservoirs on either side of the Santa Clara Valley but occasionally in Coyote Valley as well.

Small mammal control may reduce prey availability for these species, but such effects would be localized, and because of the low numbers of eagles that forage in Proposed Project impact areas, changes in prey availability resulting from proposed maintenance activities are not expected to impact eagle populations. Impacts on fish would similarly have very few effects, if any, on bald eagles because these birds forage little (if at all) along the creeks in the Project Area, and instead forage primarily at reservoirs. Impacts of the Proposed Project are not expected to result in the loss of nesting sites for either of these two eagle species, and would only impact relatively small areas of foraging habitat.

Currently, the only location where SMP Update activities are projected close to a nest of either eagle species would be along the Almaden Calero Canal east of Almaden Road and west of Calero Reservoir; here, an active golden eagle nest on an electrical transmission tower is located approximately 100 feet from the canal. If canal maintenance activities, such as the sediment removal and vegetation management work projected for this location, or surveys for other special-status species, were to occur in close proximity to this nest during the breeding season, this may result in abandonment of the nest, or at

least abandonment of eggs or young that were in the nest at the time. A low probability exists that abandonment would occur, as SMP activities have occurred (even during the breeding season) near this nest for years without abandonment. Nevertheless, new birds that were not habituated to such disturbance could occupy that nest site, and over the 10-year duration of the Proposed Project, some potential would exist for these species to increase in abundance and to begin nesting in other areas where they could be impacted by Proposed Project activities. This could be particularly true for the bald eagle, which has been increasing in abundance in the Project Area over the past several decades. Additionally, impacts to these species may occur because of unprojected activities (e.g., bank stabilization, management of animal conflicts, and minor maintenance). The use of certain rodenticides (e.g., strychnine and anticoagulants such as chlorophacinone and diphacinone) to prevent animal conflicts on levees may result in the secondary poisoning of eagles that consumed rodents or invertebrates that consumed the poison bait (USEPA 2009). In the absence of BMPs, activities causing a substantial increase in noise, movement of equipment, or human presence near active nests during the breeding season may result in nest abandonment, and possibly the loss of eggs or young as a result.

Implementation of pre-project planning BMPs would reduce impacts on bald and golden eagles by minimizing the extent of maintenance activities. In addition, implementation of BMPs specifically designed to protect eagles would avoid or minimize impacts to these species through the identification of active nests and implementation of non-disturbance buffers around such nests. These BMPs are as follows, and a description of each is provided in Table 2-12.

Applicable Best Management Practices

BMP GEN-4: Minimize the Area of Disturbance
BMP GEN-6: Minimize Impacts to Nesting Birds via Site Assessments and Avoidance Measures
BMP ANI-1: Avoid Redistribution of Rodenticides
BMP ANI-3: Burrowing Owl, Bald Eagle, and Golden Eagle Buffer Zone

Conclusion

Implementation of these BMPs~~S~~ would be adequate to assure that the impact to the bald eagle and golden eagle would be less than significant, and no mitigation would be required.

Impact BIO-26: Impacts on the American Peregrine Falcon (Significance Criteria A, B, and E; Less than Significant)

In natural habitats, the American peregrine falcon (a state fully protected species) nests on ledges and in caves on steep cliffs. However, some pairs of this species are highly adapted to the presence of human development, and as a result, this species may nest on and forage from buildings, bridges, and electrical transmission towers throughout the Project Area and utilize urban pigeon populations for prey. American peregrine falcons are known to breed and forage in the Project Area, but the only known recent breeding locations are on San Jose City Hall and on electrical transmission towers in saline managed ponds near Sunnyvale and Alviso. Although no suitable cliff habitats are present in the Project Area, other buildings and transmission towers provide suitable nest sites.

No known nesting sites of the peregrine falcon are currently located in areas close enough to projected SMP Update work sites that maintenance activities would disturb nesting falcons. However, because of the species' recent population increases in California, a high probability exists that the abundance and distribution of nesting peregrine falcons would increase during the 10-year span of the Proposed Project. Because such nesting would most likely occur on buildings or in old raptor or corvid nests on electrical towers, nest sites that would be unlikely to be physically disturbed by project-related activities, physical loss of nesting sites is not expected to occur. Furthermore, because peregrine falcons are aerial foragers and adapted to some extent to human activity, the potential for maintenance activities to disturb a nest to the point of abandonment would be very low. However, peregrine falcons possibly could establish new nests over the next 10 years in areas close enough to Proposed Project activities that the increased noise and movement of people and heavy equipment in close proximity to an active nest during the breeding season could result in abandonment of the nest, including eggs and young. Additionally, unprojected activities (e.g., bank stabilization, management of animal conflicts, sediment reuse/disposal, and minor maintenance) potentially could occur near future peregrine falcon nests.

Implementation of pre-project planning BMPs would reduce impacts on American peregrine falcons by minimizing the extent of maintenance activities. In addition, implementation of BMPs specifically designed to protect nesting birds would avoid or minimize impacts to the species through the identification of active nests and implementation of non-disturbance buffers around such nests. These BMPs are as follows, and a description of each is provided in Table 2-12.

Applicable Best Management Practices

BMP GEN-4: Minimize the Area of Disturbance
BMP GEN-6: Minimize Impacts to Nesting Birds via Site Assessments and Avoidance Measures

Conclusion

Implementation of these BMPs would be adequate to assure that the impact to American peregrine falcons would be less than significant, and no mitigation would be required.

Impact BIO-27: Impacts on the Yellow Warbler
(Significance Criteria A, B, and E; Less than Significant with Mitigation)

The yellow warbler is a widespread but uncommon breeder in riparian habitats in the Project Area. Because of the widespread but often patchy nature of high-quality habitat for this species, and thus of occurrences of this species, suitable habitat for the yellow warbler in the Project Area was not mapped for this analysis. Suitable breeding habitat consists of riparian woodlands, often with an overstory of mature cottonwoods and sycamores, a midstory of box elder and willow, and a substantial shrub understory (Bousman 2007j). Riparian areas with reduced understory resulting from grazing or disturbance are generally not used by this species, and riparian corridors lacking open ruderal or herbaceous vegetation along the edges or with development up to the corridor edge are often avoided as well. The yellow warbler breeds in very low numbers along the lower reaches of South Bay streams, being somewhat more common in the upper reaches of the

cottonwood/willow-dominated zone and occasionally riparian habitats dominated by sycamores, alders, and other species as well. In the South County, the species has been recorded breeding in riparian habitat along Llagas, Uvas/Carnadero, and Pacheco creeks, as well as the Pajaro River. Yellow warblers are an abundant migrant throughout the Valley during spring and fall.

As discussed under *Determination of Impacts to Wildlife and Fisheries*, proposed maintenance activities may affect yellow warbler habitat (breeding or foraging) and/or individuals (e.g., disturbance of active nests during maintenance activities). Yellow warbler eggs or young in nests may be killed or injured during maintenance activities (e.g., tree removal), resulting from nest destruction by construction personnel or equipment, or by removal of vegetation containing a nest. Because this species often nests fairly low in trees, removal of the lower limbs of trees ("limbing up") would remove habitat and, during the nesting season, could result in the direct loss of active nests. Maintenance activities causing a substantial increase in noise, movement of equipment, or human presence near active nests also may result in nest abandonment, and possibly the loss of eggs or young as a result. Human disturbance leading to reduced attendance of nests potentially could increase the risk of brood parasitism by brown-headed cowbirds. Such impacts may occur because of both projected sediment removal and vegetation management activities and unprojected activities (e.g., bank stabilization or management of animal conflicts). In addition, suitable habitat for yellow warblers may be temporarily lost (e.g., caused by pruning, hand removal, or herbicide application).

Impacts to riparian woodland, forest, and scrub-shrub communities from projected vegetation management activities are summarized in Table 3.3-7. Because of overlap in projected activities within a specific area, as well as the sporadic nature of this species' occurrence in riparian habitat throughout the Project Area, the acreage of potential yellow warbler habitat that is projected to be impacted is difficult to quantify. Nevertheless, the total acreage of riparian woodland, forest, and scrub-shrub communities projected to be impacted by herbicide use (120.8 acres) indicates the minimum area of potential nesting and foraging habitat for the species that would be impacted. Impacts on yellow warblers, including riparian habitat loss, resulting from the Proposed Project may have a substantial impact on local and regional populations of the species.

Implementation of pre-project planning BMPs would reduce impacts on yellow warblers by minimizing the extent of maintenance activities. In addition, BMPs specifically designed to protect nesting birds would avoid or minimize impacts to this species through implementation of non-disturbance buffers around active nest sites. These BMPs are as follows, and a description of each is provided in Table 2-12.

Applicable Best Management Practices

BMP GEN-4: Minimize the Area of Disturbance
BMP GEN-6: Minimize Impacts to Nesting Birds via Site Assessments and Avoidance Measures

Conclusion

Implementation of these BMPs would reduce impacts on yellow warblers primarily by avoiding impacts to nesting birds. However, residual impacts would occur because of the

extent of riparian habitat impacts and the frequency with which repeated impacts would occur. Impacts on yellow warblers, including riparian habitat loss, resulting from the Proposed Project would be potentially significant because populations of the species and available habitat are limited locally and regionally. Thus, the loss of habitat or individuals may have a substantial impact on local and regional populations of the species (Significance Criteria A, B, and E). Mitigation Measure BIO-14 would be implemented to reduce the impact to a less-than-significant level.

As discussed under Impact BIO-2, Mitigation Measure BIO-2 would require SCVWD to provide compensatory mitigation for impacts to riparian habitat. The riparian planting and restoration program would provide continued high-quality riparian habitat along SCVWD-maintained streams. However, such riparian habitat mitigation may not benefit yellow warblers if it occurred in areas where the species would not breed. Mitigation Measure BIO-14 would be implemented to reduce the impacts on the yellow warbler to a less-than-significant level.

Mitigation Measure BIO-14: Implement Compensatory Mitigation for the Yellow Warbler

For impacts to occupied yellow warbler breeding habitat (i.e., riparian habitat known to have been occupied in recent years by the species) in areas for which mitigation has not already been provided for the 2002–2012 SMP, implementation of Mitigation Measure BIO-2 will be required to occur in areas where riparian habitat creation, restoration, and preservation will benefit yellow warblers (e.g., in relatively undeveloped reaches of creeks rather than in creeks surrounded closely on both sides by development), such that mitigation according to these measures occurs at a ratio of no less than 1:1 (on an acreage basis). SCVWD will determine whether impacted riparian habitat is suitable for this species on the basis of breeding-season surveys or comparison of habitat conditions to those in known occupied areas.

MM BIO-14 will mitigate impacts to the yellow warbler to less-than-significant levels by restoring habitat suitable for use by this species, thereby ensuring that the SMP does not substantially reduce the number or restrict the range of this rare species, have a substantial adverse effect on this special-status species, or impede the use of its nursery sites.

Impact BIO-28: Impacts on the Yellow-breasted Chat (Significance Criteria A, B, and E; Less than Significant with Mitigation)

The yellow-breasted chat is a very scarce breeder in the Project Area because of the loss of suitable breeding habitat and the presence of brown-headed cowbirds (Bousman 2007b). Optimal chat habitat is characterized by relatively large patches of riparian vegetation, with a thick shrubby understory and a few taller trees, but little overall canopy cover. In recent years, chats have been recorded in the largest numbers, and most regularly, along lower Llagas Creek, from the vicinity of the South County Regional Wastewater Authority Plant downstream to the Pajaro River (Padley 2010, H. T. Harvey & Associates 2010c), likely because of both the lack of development on either side of this reach of creek and to the weedy nature of the levee in this area, as such weedy vegetation provides foraging habitat for chats adjacent to their woody riparian breeding habitat. Elsewhere, nesting has

been confirmed recently in the Project Area only along Coyote Creek upstream from U.S. Highway 101 near Hellyer Park, where a family group was seen in 1995 (S. Rottenborn, pers. obs.). However, the species may breed in small numbers elsewhere on the valley floor (e.g., along lower Uvas/Carnadero Creek, the Pajaro River, and possibly elsewhere) in willow-dominated riparian habitats. Habitat for this species is not mapped for this analysis because of the species' patchy distribution.

The Proposed Project may affect yellow-breasted chat habitat for breeding or foraging and/or individuals (e.g., disturbance of active nests during maintenance activities). Yellow-breasted chat eggs or young in nests could be killed or injured during maintenance activities (e.g., tree removal) resulting from nest destruction by construction personnel or equipment (e.g., knocking nests out of vegetation), or by removal of vegetation containing a nest. Maintenance activities causing a substantial increase in noise, movement of equipment, or human presence near active nests also may result in nest abandonment, and possibly the loss of eggs or young as a result. Human disturbance leading to reduced attendance of nests potentially could increase the risk of brood parasitism by brown-headed cowbirds. Such impacts may occur because of both projected sediment removal and vegetation management activities and unprojected activities (e.g., bank stabilization, management of animal conflicts, and minor maintenance).

Suitable habitat for yellow-breasted chats may be temporarily lost as a result of vegetation management activities (e.g., herbicide application and pruning of lower limbs), especially along the Uvas/Carnadero Creek downstream from Highway 152, Llagas Creek downstream from Highway 152, and the Pajaro River. In particular, hand removal of vegetation, mowing, and herbicide application are projected to affect a large portion of suitable habitat along Llagas Creek; depending on the distribution of target vegetation, herbicide application could occur along up to 100 percent of the bank/bench from the Pajaro River confluence to Highway 152, on both sides of the creek. Because herbicide application would occur twice yearly (early winter/late fall and early spring) keeping vegetation short throughout the species' breeding season, vegetation management activities would substantially reduce the value of the area as breeding and foraging habitat for the yellow-breasted chat. Surveys of lower Llagas Creek in 2010 documented the highest concentration of breeding yellow-breasted chats ever recorded in Santa Clara County, and many of the birds observed were foraging in tall, weedy, herbaceous vegetation along the sides of the levees (H. T. Harvey & Associates 2010b). Because of the importance of this reach of lower Llagas Creek to regional yellow-breasted chat populations, such an impact on the species' populations would be substantial.

Bank stabilization activities could have temporary or permanent impacts on suitable habitat for the species, depending on the type of stabilization methods employed (e.g., softscape vs. hardscape), but the likelihood of permanent impacts to large areas of chat habitat would be minimal because of the locations where this species would be concentrated, relative to areas of likely bank stabilization needs.

Implementation of pre-project planning BMPs would reduce impacts on yellow-breasted chats by minimizing the extent of maintenance activities. In addition, implementation of BMPs specifically designed to protect nesting birds would avoid or minimize impacts to this species through implementation of non-disturbance buffers around active nest sites. These BMPs are as follows, and a description of each is provided in Table 2-12.

Applicable Best Management Practices

BMP GEN-4: Minimize the Area of Disturbance
BMP GEN-6: Minimize Impacts to Nesting Birds via Site Assessments and Avoidance Measures

Conclusion

Implementation of these BMPs would reduce impacts on yellow-breasted chats by avoiding impacts to nesting birds. However, residual impacts would remain because of the degradation of habitat along lower Llagas Creek resulting from repeated herbicide applications, pruning, and other maintenance activities. Because of the importance of this reach of lower Llagas Creek to regional yellow-breasted chat populations, such an impact would be substantial on the species' populations, and therefore would be significant (Significance Criterion B).

As discussed under Impact BIO-2, Mitigation Measure BIO-2 would require SCVWD to provide compensatory mitigation for impacts to riparian habitats. This mitigation may take a variety of forms, and such mitigation would only benefit the yellow-breasted chat if riparian mitigation were to occur within one of the few areas where this species breeds in the Project Area. Nevertheless, riparian habitat mitigation in at least some areas would benefit this species.

As discussed under Impact BIO-23, Mitigation Measure BIO-12 would give SCVWD two options for maintaining suitable habitat conditions for the least Bell's vireo along lower Llagas Creek: ensuring that maintenance of that reach would allow the continued presence of suitable habitat conditions (Mitigation Measure BIO-12A), or providing similar conditions at an off-site location along a South County creek (Mitigation Measure BIO-12B). Implementation of either of those measures also would mitigate impacts of vegetation management along lower Llagas Creek for the yellow-breasted chat, by ensuring that suitable breeding and foraging habitat for the chat was maintained. Mitigation Measure BIO-12 would be implemented to reduce the impact to the yellow-breasted chat to a less-than-significant level.

Impact BIO-29: Impacts on the Grasshopper Sparrow (Significance Criteria A, B, and E; Less than Significant)

The grasshopper sparrow (a California species of special concern) breeds in open, short grasslands with scattered clumps of shrubby vegetation, constructing domed ground nests with grasses in patches of dense vegetation (Vickery 1996, Sutter and Ritchison 2005, Unitt 2008). In the Project Area, breeding grasshopper sparrows occur in several areas in the foothills of the Santa Cruz Mountains, along the foothills of the Diablo Range from Calaveras Reservoir southeast to the hills above Pacheco Creek, and in the southeast portion of the Project Area where the hills drop down to the Pajaro River Valley (Heller 2007). They do not breed on the Valley floor. Grasshopper sparrows may occur somewhat more widely during migration, but they are seldom seen in the South Bay outside the breeding season.

Because the grasshopper sparrow does not breed on the valley floor, potential impacts from the Proposed Project would be limited to activities associated with canals occurring

at the upper elevational limit of the Proposed Project. However, little overlap (if any) would exist between suitable grasshopper sparrow habitat and potential maintenance activities. For example, grasshopper sparrows are relatively common breeders on the mid- and upper slopes of Coyote Ridge, but they have not been recorded breeding at the base of Coyote Ridge where the Coyote Canal is located. The same situation occurs with respect to canals on Tulare Hill, the Santa Teresa Hills, and the area west of Calero Reservoir. As a result, very few, if any, breeding grasshopper sparrows would be adversely affected by the Proposed Project and only minor amounts of suitable habitat may be affected. It is possible that activities associated with canals may disturb foraging birds, and possibly disturb low-elevation breeders to the point that a very limited number of nests would be impacted. However, such effects would impact only a very small proportion of regional populations of this species; thus, this impact would be less than significant.

Conclusion

Even in the absence of mitigation measures, impacts resulting from the Proposed Project would be less than significant because the proposed activities would not result in a substantial impact on regional populations of the species. SCVWD would implement BMP GEN-6 (*Minimize Impacts to Nesting Birds via Site Assessments and Avoidance Measures*) regardless of the potential for significant impacts (i.e., to comply with the federal Migratory Bird Treaty Act), and thus the potential for adverse effects on nesting grasshopper sparrows would be further reduced. Therefore, no mitigation would be required.

Impact BIO-30: Impacts on the Northern Harrier (Significance Criteria A, B, and E; Less than Significant)

In the northern portion of the Project Area, the northern harrier (a California species of special concern) nests in South Bay marshes, particularly the interiors of larger tidal salt and brackish marshes. No sediment management activities are proposed in such areas; however, herbicide application activities are proposed adjacent to potential northern harrier nesting habitat on levees along Coyote Slough, around Newby Island, near Pond A4, and near the mouth of San Francisquito Creek. Because herbicide application activities would not occur in the marsh habitat itself and would be of short duration in any specific area, these activities are not expected to disturb nesting harriers to the point of nest abandonment.

In the southern portion of the Project Area, harriers prefer nesting habitat in the vicinity of or contiguous with large expanses of open grassland, fallow agricultural areas, and impoundments at the South County Regional Wastewater Authority Plant. Although maintenance activities may occur along the margins of this habitat (e.g., along lower Llagas Creek), the potential for such activities to disturb a nest to the point of abandonment would be very low because harriers nest in the interiors of large expanses of open habitat, not very close to levees where Proposed Project activities would be concentrated in the South County. Disturbance of foraging habitat would be unlikely to have a substantial effect on local and regional populations of the species because of the low number of breeding birds relative to the extent of suitable foraging habitat and abundance of prey.

Conclusion

Even in the absence of mitigation measures, impacts resulting from the Proposed Project would be less than significant because the proposed activities would not result in a substantial impact on regional populations of the species. Because SCVWD would implement BMP GEN-6 (*Minimize Impacts to Nesting Birds via Site Assessments and Avoidance Measures*) regardless of the potential for a significant impact, potential adverse effects on northern harriers resulting from Proposed Project activities would be further reduced. Therefore, no mitigation would be required.

Impact BIO-31: Impacts on the White-Tailed Kite and Loggerhead Shrike (Significance Criteria A, B, and E; Less than Significant)

The white-tailed kite (a state fully protected species) and loggerhead shrike (a California species of special concern) nest primarily in open grassland, shrubland, and agricultural habitats that contain suitable brush, shrubs, or trees for nesting. Although white-tailed kites require more extensive habitat for foraging, while loggerhead shrikes may be present in areas providing relatively smaller patches of open grassland, these species are assessed together because they breed and forage in similar habitats in the Project Area and because the potential effects of the Proposed Project on these species would be similar.

Proposed Project maintenance activities may affect white-tailed kite and loggerhead shrike habitat (breeding and foraging) and could possibly impact active nests, including eggs or nestlings. Such impacts may occur because of both projected sediment removal and vegetation management activities and unprojected activities (e.g., bank stabilization, management of animal conflicts, and minor maintenance).

Clearing and grading for access roads and staging areas may result in the direct loss of habitat through the disturbance of grasslands. Maintenance activities also may result in a reduction in the quality of breeding or foraging habitat because of the introduction of non-native vegetation. Small mammal control may reduce the suitability of habitat by reducing available prey for these species, and herbicides and pesticides used for vegetation management or management of animal conflicts control may deplete prey, especially for loggerhead shrikes that regularly feed on large insects. However, because of the relatively small amount of grassland and agricultural habitats that would be affected relative to the extent of suitable foraging habitat and prey in the region, impacts on habitat for white-tailed kites and loggerhead shrikes would be considered less than significant.

Proposed Project activities, particularly vegetation management, may degrade habitat, as compared to existing conditions, and may maintain habitat in a reduced-quality state so that it supported fewer shrikes and kites over the long term. This may occur especially along lower Llagas Creek, where multiple pairs of these species exist in areas that have not been subjected to recent, intensive maintenance. However, relatively few pairs are expected to be affected, both because of the limited extent of areas where such effects would occur and because shrikes and kites likely would continue to nest, though possibly in lower numbers, in areas with such vegetation management.

Eggs or young in nests may be killed or injured during maintenance activities, resulting from destruction by construction personnel or equipment, or removal of vegetation

containing nests. Furthermore, nesting of both species may be disrupted to the extent that nests would fail because of disturbance that was too frequent or too severe. In the absence of BMPs, impacts to active nests of white-tailed kites and loggerhead shrikes could be substantial because these species' populations are relatively limited locally, and because SMP Update activities are projected in a number of areas where these species occur.

Implementation of pre-project planning BMPs would reduce impacts on white-tailed kites and loggerhead shrikes by minimizing the extent of maintenance activities. In addition, implementation of BMPs specifically designed to protect nesting birds would avoid or minimize impacts to these species through the identification of active nests and implementation of non-disturbance buffers around such nests. These BMPs are as follows, and a description of each is provided in Table 2-12.

Applicable Best Management Practices

BMP GEN-4: Minimize the Area of Disturbance
BMP GEN-6: Minimize Impacts to Nesting Birds via Site Assessments and Avoidance Measures

Conclusion

Implementation of these BMPS would be adequate to assure that the impact on white-tailed kites and loggerhead shrikes would be less than significant and no mitigation would be required.

Impact BIO-32: Impacts on the Redhead, Short-Eared Owl, Long-Eared Owl, Vaux's Swift, and Olive-Sided Flycatcher
(Significance Criteria A, B, and E; Less than Significant)

The redhead, short-eared owl, long-eared owl, Vaux's swift, and olive-sided flycatcher are all California species of special concern (when breeding) that occur in the Project Area in limited numbers, primarily as non-breeders, but they potentially could nest in the vicinity of Proposed Project work sites. The redhead has been recorded nesting in the Project Area on only a few occasions, in the 1970s and 1980s, at the Palo Alto Flood Control Basin. Redheads have a low probability of nesting elsewhere in the Project Area.

The short-eared owl is a migrant and winter visitor that forages in marshes, grasslands, and agricultural areas. Historically, it has bred very locally and sporadically in the South Bay, and it is unlikely that this species currently breeds in the Project Area. If it still breeds in the area, the Palo Alto Flood Control Basin is the only likely nesting area for the species. Any Proposed Project activities in the vicinity of the Flood Control Basin, either projected or unprojected, would occur along its periphery, whereas short-eared owls would nest toward the interior of the Flood Control Basin.

The long-eared owl is not known to nest in the Project Area (Noble 2007), but it has been recorded nesting just outside the Project Area in Ed Levin County Park, west of Calaveras Reservoir (Noble 2007). Accordingly, it is possible that a few pairs may occur in riparian, oak woodland, or mixed evergreen forest in the Project Area, particularly in foothill areas. On the Valley floor, where most SMP Update activities are projected, the species most likely occurs only as a rare and irregular non-breeding visitor.

Vaux's swift is the only special-status bird species that breeds in the Project Area, exclusively in residential portions of the area. Although Vaux's swifts nest in small numbers in coniferous forest habitats in the Santa Cruz Mountains, within the Project Area they are known to nest only in chimneys in western residential areas.

Olive-sided flycatchers are associated with coniferous forest habitats. They breed widely in the Santa Cruz Mountains and more sparingly in the Diablo Range, but do not breed on the Santa Clara Valley floor. Likely, few pairs nest at sites below 1,000 feet in elevation. Olive-sided flycatchers are known to nest along Upper Penitencia Creek in Alum Rock Park, and occasionally around Calero Reservoir in the Project Area (Bousman 2007c). Suitable habitat also is present in the Project Area along the uppermost reaches of Uvas Creek and Bodfish Creek.

An extremely low potential would exist for nesting pairs of the redhead, short-eared owl, and long-eared owl to be disturbed by Proposed Project activities because of these species' current distribution in the Project Area (i.e., the lack of known nesting pairs), and the number of individuals that could possibly be disturbed would be very low. Because swifts nesting in residential areas are adapted to human activity to some extent, and because of the limited number of pairs of this species that nest in the Project Area, the potential for maintenance activities to disturb a nest to the point of abandonment would be extremely low. A very few pairs of olive-sided flycatchers possibly could nest in areas where Proposed Project activities would occur, and thus some potential would exist that the removal of vegetation could result in the physical loss of nests or that increased maintenance disturbance during the breeding season could result in the incidental loss of fertile eggs or nestlings or otherwise lead to nest abandonment.

Conclusion

Because of the very low numbers of any of these species that could possibly be affected by Proposed Project activities, potential impacts on these five species would be considered less than significant. However, because SCVWD would implement BMP GEN-6 (*Minimize Impacts to Nesting Birds via Site Assessments and Avoidance Measures*) regardless of the potential for significant impacts, the potential for adverse effects on these species resulting from Proposed Project activities would be further reduced. Therefore, no mitigation would be required.

Impact BIO-33: Impacts on the Tricolored Blackbird (Significance Criteria A, B, and E; Less than Significant)

The tricolored blackbird (a California species of special concern at its nesting colonies) typically nests in tall, dense, stands of cattails or tules, but also nests in blackberry, wild rose bushes, and tall herbs. Nesting colonies are usually located near fresh water. The species is highly colonial in its nesting habits and forms dense breeding colonies that, in some parts of the Central Valley, may consist of up to tens of thousands of pairs. In the Project Area, the species is patchily distributed in the Santa Clara Valley, reflecting the patchy nature of its breeding habitat (Rottenborn 2007a).

The tricolored blackbird has not been recorded breeding in the Project Area during the last 10 years. However, because nesting habitat for this species is short-lived because of

succession, colonies generally are not present at a specific location for more than a few years. Additionally, because tricolored blackbirds are itinerant nesters, and because their nesting habitat is ephemeral, it is possible for this species to colonize or recolonize an area as suitable breeding habitat becomes available. As a result, over the 10-year Proposed Project span, new colonies of tricolored blackbirds may appear in the Project Area if new areas of emergent vegetation were established (e.g., because of wetland restoration or in stormwater detention basins, ponds that were constructed or modified, or creeks with extensive emergent vegetation) in areas surrounded by extensive open foraging habitat. Possible areas where tricolored blackbird breeding habitat may occur within the Project Area would include the Almaden Valley, the Coyote Valley, and South County areas. The Proposed Project may affect tricolored blackbird habitat (breeding, foraging, or wintering) and/or individual nests (e.g., during maintenance activities).

Suitable habitat for tricolored blackbirds may be temporarily lost as a result of sediment removal and vegetation management activities (e.g., herbicide application). However, this impact would be considered less than significant because: (1) habitat availability would not limit its occurrence in the county, based on the species' decade-long absence from all but the eastern part of the county and the availability of suitable nesting habitat in some areas that have not been occupied in years; (2) no high-quality habitat exists with regular tricolored blackbird use that is projected to be impacted by maintenance activities; and (3) the sites within the Project Area that have been used in recent decades have typically been used for only 1 to a few years, in part because of the nomadic nature of this species' colonies and in part because of succession (e.g., conversion of a cattail marsh into dense willows).

If a colony of tricolored blackbirds were to establish in the Project Area during the 10-year span of the Proposed Project, eggs or young in nests may be killed or injured during construction activities from crushing by construction personnel or equipment. Furthermore, nesting may be disrupted to the extent that nests would fail because of disturbance that was too frequent or too severe. Such impacts may occur because of both projected sediment removal and vegetation management activities and unprojected activities (e.g., bank stabilization, management of animal conflicts, sediment reuse/disposal, and minor maintenance). Because tricolored blackbirds only sporadically breed in the Project Area and colonies in the Central Valley may consist of thousands of birds, the significance of this impact would be dependent on the size of the breeding colony disturbed. Disturbance of a small colony would not substantially affect a regional population that did not rely heavily on breeding habitat in the Project Area. However, impacts to larger breeding colonies may result in a more substantial impact on regional populations of the tricolored blackbird.

Implementation of pre-project planning BMPs would reduce impacts on tricolored blackbirds by minimizing the extent of maintenance activities. In addition, BMPs specifically designed to protect nesting birds would avoid or minimize impacts to this species through the identification of active nests and implementation of non-disturbance buffers around such nests. These BMPs are as follows, and a description of each is provided in Table 2-12.

Applicable Best Management Practices

BMP GEN-4: Minimize the Area of Disturbance
BMP GEN-6: Minimize Impacts to Nesting Birds via Site Assessments and Avoidance Measures

Conclusion

Implementation of these BMPS would be adequate to assure that the impact on tricolored blackbirds would be less than significant and no mitigation would be required.

Impact BIO-34: Impacts on Non-Breeding, Special-Status Birds (Significance Criteria A, B, and E; Less than Significant)

Several special-status bird species occur in the Project Area as non-breeding migrants, transients, or foragers, but they are not known or expected to breed or occur in large numbers in the Project Area; these include the bank swallow, California condor, Swainson's hawk, California least tern, and western least bittern.

The bank swallow (state listed as a threatened species) forages aerially throughout the Project Area, most likely in areas with greater numbers of aerial insects such as over ponds and streams, but occurs rarely and only as a transient. The California condor (federally and state listed as an endangered species) has not been recorded in the Project Area since its extirpation from the wild and subsequent reintroduction to San Benito and Monterey counties. In mid-June 2011, up to five individuals were recorded at the summit of Mt. Hamilton, east of San Jose and well above the 1,000-foot elevation contour that delineates the Project Area, indicating that the species occasionally ventures into Santa Clara County. If condors occur in the Project Area at all, now or in the future, they likely would occur as foragers in extensive grasslands offering carrion; like the June 2011 individuals, they likely would occur predominantly at higher elevations, rather than in lower valley-floor areas where Proposed Project activities would occur. Swainson's hawk (state listed as a threatened species) occurs as an infrequent transient during migration in agricultural, grassland, and oak woodland habitats. The California least tern (federally and state listed as endangered and a state fully protected species) uses managed pond habitats along the edge of the Bay as post-breeding foraging and staging areas. The western least bittern (a California species of special concern) has never been recorded breeding in the Project Area and likely occurs here only as an occasional migrant, foraging in freshwater and brackish marshes.

The Proposed Project would have some potential to impact foraging habitats and/or individuals of these species. Maintenance activities associated with the Proposed Project may result in a temporary direct impact through the alteration of foraging patterns (e.g., avoidance of work sites because of increased noise and activity levels during maintenance activities) but would not result in the loss of individuals. Furthermore, the Project Area does not provide important foraging habitat used regularly or by large numbers of individuals of any of these species, with the exception of the California least tern. This tern uses managed ponds along the Bay edge in Santa Clara County as an important post-breeding staging area. However, no Proposed Project activities that would adversely affect the use of these ponds by post-breeding least terns would occur; any such activities would

occur at the margins of ponds, and thus would not preclude the use of ponds for roosting or foraging.

Conclusion

Impacts to these species and their habitats resulting from the Proposed Project would be very limited, and for some of these species may not occur at all. Accordingly, maintenance activities would not result in substantial reductions in local or regional populations, and would only affect a very low proportion of regionally available habitat. Such an impact would be, therefore, less than significant and no mitigation would be required.

Impact BIO-35: Impacts on the Salt Marsh Harvest Mouse and Salt Marsh Wandering Shrew (Significance Criteria A, B, and E; Less than Significant with Mitigation)

The salt marsh harvest mouse and salt marsh wandering shrew are similarly associated with tidal marsh habitat in the northern portion of the Project Area (Figure 3.3-22), and the potential impacts of the Proposed Project on these species would be similar. Thus, they were assessed together. Habitat for both salt marsh harvest mice and salt marsh wandering shrew consists of pickleweed-dominated areas of tidal marshes and diked and muted tidal marshes. Salt marsh harvest mice also have been found in dense vegetation within brackish marshes in the South Bay (H. T. Harvey & Associates 2006). Of particular importance to these species is upland transitional habitat surrounding marshes that provides upland refugia during high tides.

As described under *Determination of Impacts to Wildlife and Fisheries*, maintenance activities may result in the injury or mortality of salt marsh harvest mice and salt marsh wandering shrews because of equipment use (including mowing and discing), vehicle traffic, and worker foot traffic. Individuals that vacate the area because of increased levels of noise and disturbance may be exposed to increased competition from conspecifics already occupying the area to which they were displaced and increased levels of predation because of unfamiliarity with the new area or lack of sufficient cover. Removal of vegetation may expose individual mice and shrews to predation. These impacts would be significant (Significance Criteria A and B).

Any replacement of natural bank with hardscape (e.g., concrete crib walls or sacked concrete) could result in the loss of breeding and foraging habitat for the salt marsh harvest mouse and wandering shrew. Replacement of natural banks with armoring would preclude the re-establishment of vegetation that would provide cover and foraging habitat. Conversely, replacement of “hard” bank substrates with “softer” substrates, which also potentially could occur under the SMP Update, would enhance habitat. Because bank stabilization is not a projected activity, the extent of the area over which effects resulting from bank stabilization activities may occur cannot be quantified. Based on past work records, SCVWD stabilizes about 0.75 mile of stream bank per year throughout the Santa Clara Basin, although a low potential would exist for such impacts to occur in suitable habitat for the salt marsh harvest mouse or wandering shrew.

No sediment removal is projected in areas providing potential habitat for the salt marsh harvest mouse. The nearest area of projected sediment removal is along upper Alviso Slough between Gold Street and the Union Pacific Railroad Bridge, although this area does

not provide habitat for the species. Vegetation management is projected to affect 8.3 acres of salt and brackish marsh habitats directly. Some vegetation management would result in temporary degradation of salt marsh habitat via mowing or removal of plants, which would impact habitat for the harvest mouse and wandering shrew. Impacts to this community would be as described under Impact BIO-1 for wetland and aquatic habitats. However, the majority of such impacts (6.8 acres) would occur as a result of herbicide application in perennial pepperweed-dominated areas near Coyote Slough and Coyote Bypass. This activity, which occurs in part as mitigation for impacts resulting from the Lower Coyote Creek capital project, would enhance habitat conditions by reducing the infestation of high-quality salt marsh by the invasive perennial pepperweed.

Vegetation management activities also are projected in several areas adjacent to suitable habitat for the harvest mouse and shrew, including herbicide application along the Moffett Channel outboard levee, the Coyote Creek Bypass bank/bench, Coyote Slough, Coyote Creek, around the Reach 1A waterbird pond, Guadalupe Slough, the Sunnyvale East Channel, and the mouth of San Francisquito Creek (Figure 3.3-23). Vegetation management did not occur in most of these areas from 2002–2009. Vegetation management in many of these areas only would affect vegetation on the sides of levees.

Harvest mice use such upland transitional vegetation for cover during very high winter tides. Some vegetation management would occur along lower benches; harvest mice may make greater use of these areas, particularly during very high winter tides, and thus vegetation management could reduce habitat availability, expose harvest mice to increased predation, and increase competition among individuals that were concentrated in remaining habitat. The loss of habitat resulting from vegetation management would be temporary in any given area.

The use of certain rodenticides (e.g., strychnine) to prevent animal conflicts on levees could result in the off-target poisoning of salt marsh harvest mice and wandering shrews. However, BMP ANI-2 (Prevent Harm to the Salt Marsh Harvest Mouse and California Clapper Rail) would prohibit the use of rodenticides and fumigants within the range of the salt marsh harvest mouse, as depicted in Figure 3.3-22. Because of past fill of bayside marshes, armoring of levees, and other impacts, populations of the salt marsh harvest mouse and the salt marsh wandering shrew in the Project Area are very limited in number and extent. Therefore, the effects of even temporary habitat loss because of vegetation management could substantially affect regional populations of salt marsh harvest mice and salt marsh wandering shrews because their populations and available habitat would be limited locally and regionally.

Implementation of pre-project planning BMPs would reduce impacts on salt marsh harvest mice and salt marsh wandering shrews, primarily by restricting activities that could be particularly harmful to these species in suitable habitat. For example, implementation of the BMP specifically designed to protect salt marsh harvest mice would avoid or minimize impacts to these species by requiring the presence of a biological monitor during activities that directly impact vegetated habitat of the salt marsh harvest mouse. These BMPs are as follows, and a description of each is provided in Table 2-12.

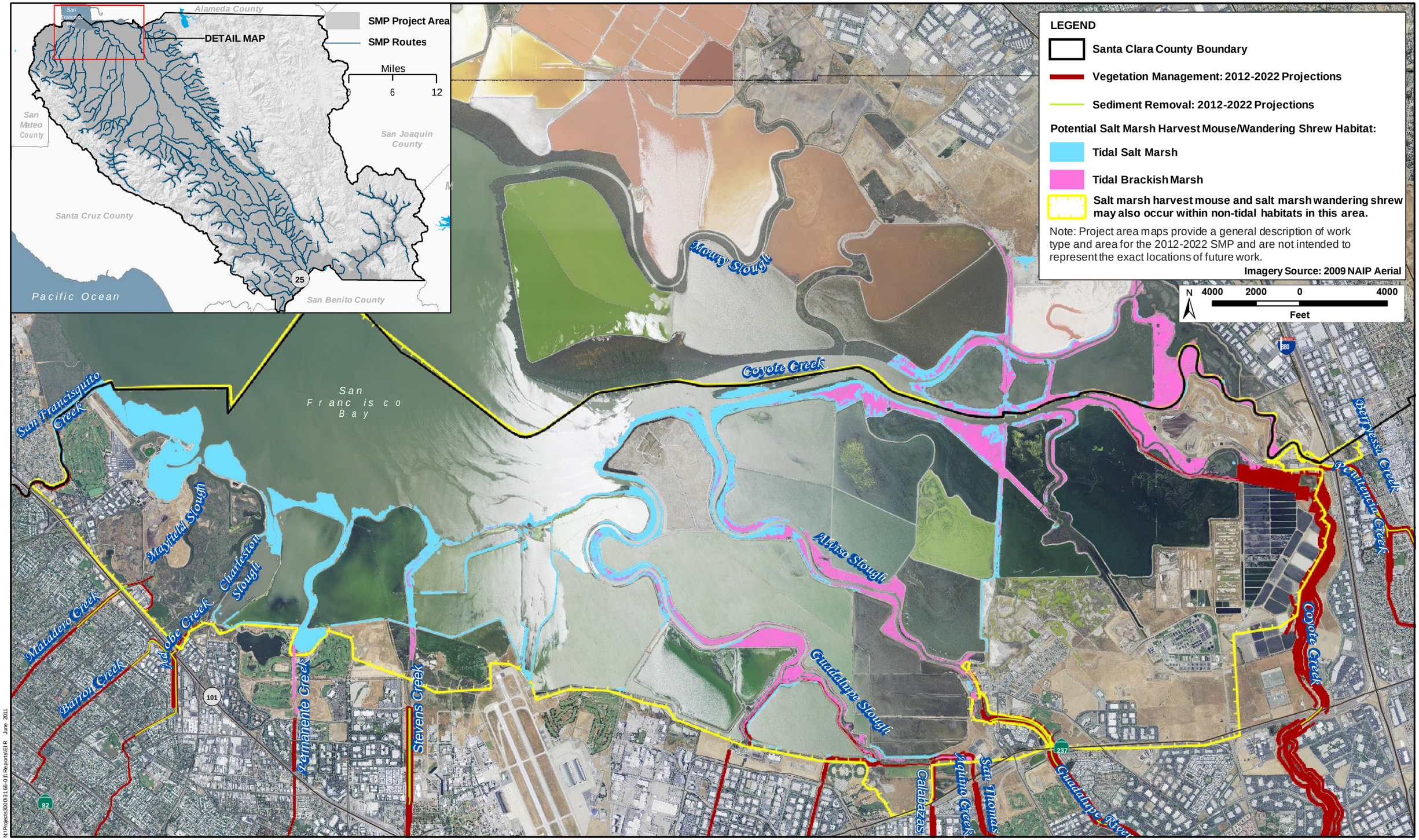

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Figure 3.3-22: Potential Salt Marsh Harvest Mouse and Salt Marsh Wandering Shrew Habitat in Santa Clara County

Santa Clara Valley Water District Stream Maintenance Program EIR (3166-01)
July 2011

N:\Projects300\3166-01\Reports\EIR June 2011

Applicable Best Management Practices

BMP GEN-4: Minimize the Area of Disturbance
BMP GEN-8: Protection of Sensitive Fauna Species from Herbicide Use
BMP GEN-11: Protection of Salt Marsh Harvest Mouse and California Clapper Rail
BMP ANI-2: Prevent Harm to the Salt Marsh Harvest Mouse and California Clapper Rail

Conclusion

Implementation of these BMPs would reduce impacts on salt marsh harvest mice and salt marsh wandering shrews considerably. However, vegetation management still would cause habitat loss that could result in loss of individuals because of increased predation or other density-dependent effects. Therefore, the effects of even temporary habitat loss (because of vegetation management could substantially affect regional populations of salt marsh harvest mice and salt marsh wandering shrews) resulting from the Proposed Project would be potentially significant (Significance Criteria A, B, and E).

As described under Impact BIO-3, management of the invasive perennial pepperweed in the Coyote Creek Bypass area would benefit the northern coastal salt marsh community, and salt marsh harvest mouse habitat, and thus would not require mitigation. Otherwise, as mitigation for impacts to tidal habitats and tidal marsh species predicted to result from the 2002–2012 SMP, SCVWD would implement Mitigation Measure BIO-1 that (as described) restored the "Island Ponds" (Ponds A19, A20, and A21), located between Coyote Slough and Mud Slough near Alviso, to tidal action. Monitoring has documented the formation of nascent tidal marsh habitat, including extensive channel networks, within these ponds. Thirty acres of tidal restoration within the Island Ponds was intended to serve as mitigation for impacts to tidal habitats for the 2002–2012 SMP. However, based on the actual impacts from 2002–2012~~09~~ SMP activities, only 9 acres of tidal mitigation were needed to compensate for those impacts. ~~In addition~~As a result, SCVWD created 21 acres of ~~excess~~additional tidal habitats compared to what was needed to mitigate for the actual impacts from 2002–2012 SMP activities. SCVWD would use the 21 acres of ~~excess~~ tidal marsh restoration as available mitigation for impacts to tidal wetlands and aquatic habitats, as well as tidal marsh species, under the 2012–2022 SMP Update. Physical breaching of the Island Pond levees and other physical work required for this tidal restoration has already occurred, and no further activities (other than continued monitoring of marsh development per the 2002–2012 SMP monitoring requirements) are proposed by SCVWD. Although it may take years for high-quality salt marsh harvest mouse and salt marsh wandering shrew habitat to become widespread within this marsh, suitable habitat is already present at the edges of the restored wetland, and over time, this mitigation would compensate for all impacts of Proposed Project activities on these two species, by restoring extensive vegetated tidal marsh that would provide habitat for them. It is possible that this mitigation may be refined by the USFWS during Section 7 consultation (e.g., in a Biological Opinion), or by the CDFG during CESA consultation, in which case the refined mitigation measure would be implemented. Mitigation Measure BIO-1 would be implemented to reduce impacts on the salt marsh harvest mouse and salt marsh wandering shrew to a less-than-significant level.

Impact BIO-36: Impacts on the San Francisco Dusky-Footed Woodrat (Significance Criteria A, B, and E; Less than Significant)

The San Francisco dusky-footed woodrat is a California species of special concern. The classification of the subspecies as a species of special concern was based on its limited Bay Area distribution. However, recent genetic studies by Matocq (2002) indicate the distinct genetic population (subspecies or taxon) is much larger than originally thought. The CDFG has accepted this distribution but has not changed the species of special concern designation (CDFG 2009).

The San Francisco dusky-footed woodrat is locally common in undisturbed portions of appropriate habitat throughout its range. It may occur in natural areas of woodland, scrub, or riparian habitats with dense understory or thick scrub for cover. In Santa Clara County, the highest densities of woodrats occur in riparian and oak woodland habitats where those habitats include dense vegetation understories. Relatively high densities of woodrats have also been observed in riparian habitats where invasive giant reed is the dominant vegetation (H. T. Harvey & Associates 2001). Dusky-footed woodrats may be sensitive to non-native predators, such as domestic animals and urban-adapted predators, which may limit their distribution in the more developed portions of the Project Area. Currently, with the exception of records along the northern portion of Coyote Creek and along the edges of the Valley, San Francisco dusky-footed woodrats do not occur in the more urbanized portions of the county (H. T. Harvey & Associates 2010c). Where low open valleys are less developed (e.g., Coyote Valley, Little Arthur Creek valley, and Uvas, and Llagas Creeks), woodrat populations appear to remain intact.

As described under *Determination of Impacts to Wildlife and Fisheries*, maintenance activities may result in the injury or mortality of dusky-footed woodrats because of equipment use, vehicle traffic, and worker foot traffic., particularly when taking refuge in their stick nests. In addition, woodrats may be adversely affected by implementation of animal conflict management activities (e.g., poisoning or trapping). Suitable habitat and nests may be directly lost as a result of clearing and grading for bank stabilization or stream access and through the modification of suitable habitat because of vegetation management activities, particularly the removal of giant reed, pruning, and herbicide application. Pruning may open up a stand or location to direct sunlight on a nest, which could lead to abandonment.

Direct impacts to San Francisco dusky-footed woodrats resulting from proposed SMP Update activities could potentially result in the loss of tens or even hundreds of nests and individuals, in part because of the species' abundance in suitable habitat. Indirect impacts also could occur as a result of over-crowding (as individuals lost habitat and moved to areas that were already occupied) and increased risk of predation. Populations may be fragmented if extensive areas of suitable habitat were cleared. As a result of the species' regional abundance and high reproductive capabilities, Project impacts to dusky-footed woodrats would not have a substantial effect on regional populations. However, woodrats are very important ecologically in that they provide an important prey source for raptors (particularly owls) and for predatory mammals, and their nests also provide habitat for a wide variety of small mammals, reptiles, and amphibians. As a result, the loss of large numbers of woodrats and their nests would be a substantial impact.

SCVWD would implement several BMPs, including one specifically designed to protect woodrats, to minimize impacts to this species through the identification and avoidance of occupied nests where practicable and implementation of nest relocation measures where avoidance was not feasible. These BMPs are as follows, and a description of each is provided in Table 2-12.

Applicable Best Management Practices

BMP GEN-4: Minimize the Area of Disturbance
BMP GEN-14: Protection of San Francisco Dusky-Footed Woodrat
BMP GEN-21: Staging and Stockpiling of Materials
BMP ANI-1: Avoid Redistribution of Rodenticides

Conclusion

Implementation of BMPs would be adequate to assure that impacts to dusky-footed woodrats and their habitat would be less than significant, and BMP GEN-14 also would help to protect the species that often use woodrat houses for shelter by preventing the outright destruction of nests.

Because the species' habitats are relatively widespread, impacts to their habitat would not require additional species-specific mitigation. Nevertheless, implementation of Mitigation Measure BIO-2 would compensate for impacts to riparian habitat supporting the dusky-footed woodrat, by providing riparian mitigation that could benefit this species.

Impact BIO-37: Impacts on the Pallid Bat (Significance Criteria A, B, and E; Less than Significant with Mitigation)

The pallid bat (a California species of special concern) is most commonly found in oak savannah and in open dry habitats with rocky areas, trees, buildings, or bridge structures that are used for roosting. In the Project Area, a maternity colony is present along Cochrane Road near Anderson Dam in Morgan Hill (Dave Johnston, pers. obs.). In addition, maternity colonies are present in east San Jose at a drainage south of Berryessa Creek close to Old Piedmont Road and on Chaboya Court at the end of Quimby Road; at the Highway 152 bridge over Uvas Creek west of Gilroy; and near Day Road northwest of Gilroy (Dave Johnston, pers. obs.). Individuals from these maternity roosts may forage in the Project Area, in open areas located within several miles of these roost locations. Pallid bats are known to forage along Alamitos Creek and Metcalf Road, but the locations of breeding colonies for these individuals are unknown. Potential breeding habitat is present along creeks in the Project Area in larger trees, such as oaks, sycamores, and cottonwoods.

The Proposed Project is unlikely to result in the loss of high-quality roost sites for the pallid bat because large trees (i.e., trees greater than 12 inches dbh), which are the trees most likely to support cavities that could be used by large colonies, would not be removed. Nevertheless, projected activities could result in the removal of smaller trees used as breeding or roosting sites. In addition, when trees containing roosting colonies or individual bats were removed or modified, individual bats could be physically injured or killed; subjected to physiological stress resulting from being disturbed during torpor; or face increased predation because of exposure during daylight. In addition, nursing young may be subjected to disturbance-related abandonment by their mothers. Project-related

disturbance in close proximity to a maternity roost of pallid bats, which could result from both projected sediment removal and vegetation management activities and unprojected activities (e.g., bank stabilization, management of animal conflicts, and minor maintenance), potentially could cause females to abandon their young. Maintenance activities also may result in the loss or reduction of a small amount of foraging habitat, such as streams and open grassland areas over which the bats foraged, although the extent of such impacts would not substantially affect the regional availability of foraging habitat.

Impacts on pallid bats resulting from the Proposed Project could be substantial because the species' populations and available roosting habitat are limited locally and regionally and loss of habitat or individuals may have a substantial effect on local and regional populations of the species.

SCVWD would implement two BMPs, including one specifically designed to protect bat colonies, to avoid or minimize impacts to these species through identification and avoidance of occupied roosts, implementation of non-disturbance buffers around active maternity colonies and hibernacula, and safe eviction of non-breeding bats where avoidance was not feasible. These BMPs are as follows, and a description of each is provided in Table 2-12.

Applicable Best Management Practices

BMP GEN-4: Minimize the Area of Disturbance
BMP GEN-13: Protection of Bat Colonies

Conclusion

Implementation of BMPs would reduce the impact to pallid bats considerably. However, if an occupied maternity roost was permanently impacted (e.g., caused by tree removal), or if disturbance of a maternity roost causing long-term roost abandonment occurred, the impact would be significant because this species' populations and available habitat are limited locally and regionally and loss of habitat or individuals may have a substantial impact on local and regional populations of the species (Significance Criteria A, B, and E). Mitigation Measure BIO-15 would be implemented to reduce the impacts on pallid bat roost sites to a less-than-significant level.

Mitigation Measure BIO-15: Provide Alternative Bat Roost

If a tree or structure containing a pallid bat maternity roost is to be removed by the Proposed Project, a qualified biologist will design and determine an appropriate location for an alternative roost structure. If a tree containing a maternity roost of this species is not removed, but SMP-related disturbance causes the abandonment of the roost site (even during the non-breeding season), then SCVWD may either monitor the roost site to determine whether the affected species returns to the roost, or construct an alternative roost. If SCVWD elects to monitor the roost and bats do not return within 1 year, then an alternative roost will be constructed.

A qualified biologist will determine the appropriate location for the alternative roost structure, based on the location of the original roost and habitat conditions in the vicinity. The roost structure will be built to specifications as determined by a qualified biologist, or it may be purchased from an appropriate vendor. The structure will be placed as close to the impacted roost site as feasible. SCVWD will monitor the roost for up to 3 years (or until occupancy is determined, whichever occurs first) to determine use by bats. If by Year 3 pallid bats are not using the structure, a qualified bat biologist, in consultation with the CDFG, will identify alternative roost designs or locations for placement of the roost, and monitoring of the new roost will occur for an additional 3 years (or until occupancy has been verified).

MM BIO-15 will mitigate impacts to the pallid bat to less-than-significant levels by providing alternative roosting habitat suitable for use by this species, thereby ensuring that the SMP does not substantially reduce the number or restrict the range of this rare species, have a substantial adverse effect on this special-status species, or impede the use of its nursery sites.

Impact BIO-38: Impacts on the Western Red Bat and Townsend's Big-Eared Bat (Significance Criteria A, B, and E; Less than Significant)

The western red bat (a California species of special concern) does not breed in the Project Area but roosts in the foliage of trees in Santa Clara County during winter or migration. The bat is strongly associated with intact cottonwood and sycamore valley riparian habitats in low elevations, but may roost anywhere in the Project Area and may use other trees, such as eucalyptus.

Colonies of the Townsend's big-eared bat (a California species of special concern) may occur in structures or large tree cavities, but caves and old mine shafts may be the preferred roost sites. No populations of Townsend's big-eared bats are currently known to occur on the Santa Clara Valley floor, and a low probability exists that this species would breed anywhere in the Project Area. Individual Townsend's big-eared bats, particularly solitary males, may occasionally wander through any portion of the Project Area, but they are expected to occur only as occasional non-breeding foragers.

Any western red bat that is roosting in a tree that is to be removed or pruned is expected to flush from the tree before injury or mortality could occur. However, bats flushed during the day could potentially suffer increased predation rates, and therefore the Proposed Project may cause the loss of small numbers of individuals. The Proposed Project may result in the loss of suitable habitat for the western red bat, caused by the removal of trees used as roosting sites. Maintenance activities also may result in the loss or reduction of foraging habitats, such as streams and open grassland areas over which the bats forage, although such impacts would affect a minimal proportion of regionally available habitat. Similar impacts could occur to the Townsend's big-eared bat, but because of the paucity of records of this species from the Project Area, very few individuals could potentially be impacted.

Conclusion

Impacts on western red bats and Townsend's big-eared bats would be considered less than significant because: (1) these species would be present only as a non-breeder; (2) the number of individuals that could be killed because of increased predation after being flushed during Proposed Project activities is either extremely low (in the case of Townsend's big-eared bat) or, in the case of western red bat, would represent a very small proportion of the regional non-breeding populations; and (3) the regional proportion of habitat for these species that could be affected by Proposed Project-related activities would be very low. Implementation of BMP GEN-13 would not necessarily benefit the western red bat, which tends to roost solitarily in foliage, although in the unlikely event that a Townsend's big-eared bat were to roost near projected activities, BMP GEN-13 could help to avoid or minimize impacts to the individual. No mitigation would be required.

Impact BIO-39: Impacts on Non-Special-Status Bats (Significance Criteria A and E; Less than Significant)

Common bat species are colonial species and are unique among mammals; impacts to a colony of bats may be an impact to a substantial proportion of the local population. Colonies Brazilian free-tailed bats, big brown bats, Yuma myotis, California myotis, or hoary bats (*Lasiurus cinereus*) may be present in trees, bridges, unoccupied buildings, other structures or under exfoliating tree bark throughout the Project Area.

Vegetation management activities, particularly tree removal, would have the potential to result in impacts to individuals. Although take of a small colony of non-special-status bats (i.e., less than 10 bats) would not result in a substantial impact to regional populations because of the regional abundance of these species (e.g., in comparison to the special-status species considered under Impacts BIO-37 and BIO-38), take of multiple colonies, or of a particularly large colony, of these non-special-status bats may substantially impact regional populations of any of them.

SCVWD would implement two BMPs, including one specifically designed to protect bat colonies, to avoid or minimize impacts to these species through identification and avoidance of occupied roosts, implementation of non-disturbance buffers around active maternity colonies and hibernacula, and safe eviction of non-breeding bats where avoidance was not feasible. These BMPs are as follows, and a description of each is provided in Table 2-12.

Applicable Best Management Practices

BMP GEN-4: Minimize the Area of Disturbance
BMP GEN-13: Protection of Bat Colonies

Conclusion

Implementation of these BMPs would be adequate to assure that the impact to non-special-status bats would be less than significant. Unlike the case with the pallid bat described under Impact BIO-37, suitable roost sites for these non-special-status bats are expected to be widespread enough that the loss of a roost site resulting from projected activities would not necessitate compensatory mitigation (although BMP GEN-13 would still be

implemented so that loss of individual bats within the roost did not occur). No mitigation would be required.

Impact BIO-40: Impacts on the San Joaquin Kit Fox (Significance Criteria A, B, and E; Less than Significant)

In the Project Area, the San Joaquin kit fox (federally listed as endangered and state-listed as threatened) is expected to occur only as an occasional dispersant in the vicinity of Pacheco Creek and the uppermost reaches of the Pajaro River, upstream from the Llagas Creek confluence. Even in those areas, kit fox occurrence is expected to be extremely infrequent, and at most, very low numbers of individuals would move through those areas during dispersal, between areas of known breeding activity well outside the Project Area. No SMP Update activities are projected in the portion of the county where kit foxes could occur, and SCVWD has easements in only two limited areas in this part of the county. Thus, this species would not be impacted by projected SMP Update activities, and very low potential would exist for even unprojected activities to impact this species.

However, because the SMP Update could include non-projected activities anywhere below the 1,000-foot elevation contour, a possibility would exist that some work could be required in areas where the kit fox could potentially occur. In the absence of BMPs, maintenance activities could cause a variety of effects on kit foxes including: disturbance of individuals by humans, noise, and equipment, potentially causing den abandonment; trapping individuals in dens because of compaction by equipment or filling of burrows; and secondary poisoning or reduction in prey resulting from the use of rodenticides. However, in the unlikely event that Proposed Project activities were required in any areas generally east/southeast of Frazier Lake Road and Bloomfield Avenue, BMP GEN-43 (described in Table 2-12) would be implemented to avoid any short-term or long-term impacts to individual kit foxes or their dens.

Applicable Best Management Practices

BMP GEN-43: Avoidance of Impact on the San Joaquin Kit Fox

Conclusion

Implementation of this BMP would be adequate to assure that an impact to the San Joaquin kit fox would be less than significant. No mitigation would be required.

Impact BIO-41: Impacts on the American Badger and Ringtail (Significance Criteria A, B, and E; Less than Significant)

The American badger (a California species of special concern) typically occurs in annual grasslands, oak woodland savannas, scrublands, and most habitats with stable ground squirrel populations or other fossorial rodents (e.g., gophers). Badgers occur to a lesser extent in agricultural areas, where intensive cultivation inhibits den establishment and reduces prey abundance, but they are known to use agricultural habitat for dispersal, and they may den in pastures or fallow fields. In the Project Area, badgers are known to occur primarily in foothill grasslands, but they also occur occasionally on the valley floor, primarily during dispersal events.

Badgers require large expanses of open habitat and are not typically found along riparian or stream edges. Thus, although maintenance activities may occur along the margins of large areas of open habitat, the potential for such activities to disturb a badger or an active badger den would be extremely low. Therefore, an impact to the American Badger resulting from the Proposed Project would be considered less than significant.

The status and distribution of the ringtail (a state fully protected species) in the Project Area is poorly understood. Although this species' strictly nocturnal habits may be at least partially responsible for the lack of information on its distribution in the area, it likely is very rare based on the lack of sightings and the scarcity of roadkill records (e.g., compared to the nocturnal American badger, which is much more frequently detected by roadkills). Ringtails have been recorded in the Project Area near Lexington Reservoir, near Little Arthur Creek west of Gilroy, and near the confluence of Carnadero Creek and the Pajaro River. Ringtails possibly may be present in small numbers in less developed, wooded areas elsewhere, and ostensibly suitable habitat is present in forested areas at the upper margins of the Project Area. However, this species likely is scarce throughout the majority of the area.

Bank stabilization and vegetation management activities may affect ringtails by disturbing individuals in dens and by small-scale habitat loss or modification. However, because of the very low number and limited distribution of ringtails estimated to be in the Project Area and the low probability of the presence of this species, an impact of the Proposed Project on this species would be considered less than significant. No mitigation would be required.

Impact BIO-42: Impacts on the Mimic Tryonia (Significance Criteria A and E; Less than Significant)

The mimic tryonia inhabits coastal lagoons, estuaries, and salt marshes from Sonoma County south to San Diego County (CNDDB 2011). This brackish water snail is found in permanently submerged areas in a variety of sediment types and is able to withstand a range of salinities (Kellogg 1985 as cited in Hershler et al. 1999). Little is known about the geographic distribution of mimic tryonia, but two records exist from Santa Clara County, both from the Alviso area (CNDDB 2011), and the species is assumed to occur in tidal sloughs in the Project Area. Because of the limited amount of work that is proposed in the tidal sloughs in the Project Area where this species most likely would occur, low potential would exist for overlap between this species and Proposed Project activities. Some potential would exist for water-quality effects from sediment management activities or herbicide applications to impact this species, but no expectation is projected that the limited Proposed Project activities near tidal waters would substantially affect regional populations of the mimic tryonia.

SCVWD would implement BMPs for all activities along sloughs in which the mimic tryonia could potentially occur. These BMPs are as follows, and a description of each is provided in Table 2-12.

Applicable Best Management Practices

BMP GEN-2: Instream Herbicide Application Work Window
BMP GEN-4: Minimize the Area of Disturbance
BMP GEN-8: Protection of Sensitive Fauna Species from Herbicide Use
BMP GEN-20: Erosion and Sediment Control Measures
BMP GEN-23: Stream Access
BMP GEN-26: Spill Prevention and Response
BMP GEN-30: Vehicle and Equipment Maintenance
BMP GEN-32: Vehicle and Equipment Fueling
BMP GEN-34: Dewatering in Tidal Work Areas
BMP GEN-35: Pump/Generator Operations and Maintenance
BMP SED-2: Prevent Scour Downstream of Sediment Removal
BMP SED-3: Restore Channel Features
BMP VEG-1: Minimize Local Erosion Increase from In-Channel Vegetation Removal
BMP VEG-3: Use Appropriate Equipment for Instream Removal
BMP BANK-1: Bank Stabilization Design to Prevent Erosion Downstream
BMP BANK-2: Concrete Use near Waterways

Conclusion

Implementation of BMPs would be adequate to assure that the Project would not have a significant impact on this species. No mitigation would be required.

Impact BIO-43: Impacts on the Pacific Harbor Seal (Significance Criteria A, B, and E; Less than Significant)

Although the Pacific harbor seal is not on any special-status species list, it is protected by the Marine Mammal Protection Act; therefore, the potential effects of the Proposed Project on this species are evaluated. Harbor seals occur in the Project Area in the tidal waters of South San Francisco Bay and occasionally wander up tidal sloughs. They haul out at sites that typically consist of mudflats located far from areas used regularly by humans, and near deeper water where seals forage. Haul-out sites are used by seals for resting and pupping (giving birth). Harbor seals forage in nearshore marine habitats on a variety of fishes and invertebrates. A known, primary haul-out site for harbor seals in the South Bay is present north of the Project Area at Mowry Slough in Fremont, and harbor seals are known to forage in the tidal reaches of a number of the streams entering the South Bay within the Project Area.

Proposed vegetation management activities (i.e., herbicide application) along Coyote Slough, Alviso Slough, and Guadalupe Slough potentially could disturb occasional basking or foraging harbor seals. In addition, unprojected activities (e.g., bank stabilization, management of animal conflicts, sediment reuse/disposal, and minor maintenance) potentially could occur near this species' aquatic habitats. However, no Proposed Project activities are expected to occur near known pupping or major haul-out sites. Thus, impacts to individuals are expected to be temporary, and maintenance activity-related disturbances would not lead to the separation of pups from nursing mothers or the abandonment of traditional haul-out sites. Thus, this impact would be considered less than significant.

Sedimentation, contaminated runoff, or hazardous material spills from maintenance activities may result in the temporary degradation of maintenance areas, although such effects likely would be negligible in the context of all the factors affecting this species and its habitats. Mercury mobilization and bioconcentration in fish on which harbor seals prey potentially could have a greater risk of impacting the health of harbor seals, although Proposed Project activities would increase mercury levels only incrementally in the prey that already were consumed by these seals.

Implementation of pre-project planning BMPs would reduce impacts on the Pacific harbor seal by controlling erosion and sedimentation, and preventing spills of contaminated or hazardous materials, and implementation of BMP GEN-3 would minimize potential effects of mercury mobilization. These BMPs are as follows, and a description of each is provided in Table 2-12.

Applicable Best Management Practices

BMP GEN-3: Avoid Exposing Soils with High Mercury Levels
BMP GEN-4: Minimize the Area of Disturbance
BMP GEN-20: Erosion and Sediment Control Measures
BMP GEN-26: Spill Prevention and Response
BMP GEN-32 Vehicle and Equipment Fueling

Conclusion

Implementation of these BMPs would be adequate to assure that the impact on the Pacific harbor seal would be less than significant. No mitigation would be required.

Impact BIO-44: Introduction of Invasive Species
(Significance Criteria A, B, C, D, E, and F; Less than Significant with Mitigation)

Invasive plants often have a competitive advantage because they are no longer controlled by their natural predators or other natural control mechanisms, allowing them to spread quickly out of control. In California, approximately 3 percent of plant species growing in the wild are considered invasive, but they inhabit a much greater proportion of the landscape (California Invasive Plant Council 2007). The scientific community has come to view invasive species as posing serious threats to biological diversity, second only to the threats resulting from habitat loss and fragmentation (Bossard et al. 2000). Invasive species present complex management issues; even when a species is no longer being actively introduced, it continues to spread and invade new areas. Invasive species can have an adverse effect on native species and habitats in several ways, including: by altering nutrient cycles, fire frequency and/or intensity, and hydrologic cycles; by creating changes in sediment deposition and erosion; by dominating habitats and displacing native species; by hybridizing with native species; and by promoting non-native animal species (Bossard et al. 2000).

The Project Area contains several highly invasive plant species, such as perennial pepperweed, smooth cordgrass, arundo, and yellow star thistle, which pose threats to wildlands and degrade habitat quality for special-status plants and animals. Proposed vegetation management activities, such as mowing and discing, may create conditions suitable for additional spreading of invasive plant species. Furthermore, bare upland soils

left after construction of temporary access ways or installation of bank protection may encourage growth of weedy species, and mulching or erosion control mixes may include and thus introduce invasive, non-native species.

In addition to the introduction of invasive plant species, without proper procedures, mitten crabs and other aquatic invasive invertebrates, such as the New Zealand mud snail, Quagga mussel (*Dreissena bugensis*), or zebra mussel (*Dreissena polymorpha*), could inadvertently be introduced into the Project Area or relocated from the Santa Clara Basin into the Pajaro River Basin. The spread of these and other non-native invasive species into areas formerly unoccupied could result in a substantial impact to native habitats and communities.

Implementation of pre-project planning BMPs would reduce impacts of invasive species, by minimizing the extent of maintenance activities. In addition, implementation of vegetation management and post-project restoration BMPs would result in the removal of non-native species and revegetation of areas using native plant species, and mitten crab control measures would reduce the potential for this species to be introduced into formerly unoccupied areas. These BMPs are as follows, and a description of each is provided in Table 2-12.

Applicable Best Management Practices

BMP GEN-4: Minimize the Area of Disturbance
BMP GEN-5: Mitten Crab Control Measure
BMP GEN-31: Vehicle Cleaning
BMP REVEG-1: Seeding
BMP REVEG-2: Planting Material

Conclusion

Implementation of these BMPs would reduce the potential for infestation of natural areas by, and impacts of, invasive species.

However, residual impacts may occur, as BMPs may not be sufficient to avoid new invasions or the spread of invasive species. Because of the potential degradation of a wide variety of natural communities and effects on native populations that could occur as a result of such invasions, this impact is potentially significant (Significance Criteria A-F). Mitigation Measure BIO-16 would be implemented to reduce this impact to a less-than-significant level.

Mitigation Measure BIO-16: Invasive Plant ~~Species~~ Management Program

The primary goal of the IPMP element of the SMP's compensatory mitigation package is to preserve and improve habitat within Santa Clara County streams and riparian corridors by reducing the population of invasive plant species. Controlling the spread of invasive plant species is a critical element in improving the ecological health of our streams and watersheds. Invasive plants thrive and spread aggressively negatively altering resource allocation regimes, wildlife patterns, soil stability and water quality thus degrading habitat quality and the overall ecological value of a site. In addition, invasive plants can exacerbate

flooding and fire danger, undermine structural assets, and impact access to roads, levees and trails.

The IPMP will provide compensatory mitigation for SMP vegetation impacts to upland, riparian, freshwater and tidal wetlands by eliminating or significantly reducing the population of invasive plant species from these affected habitats. The IPMP will have a two-pronged approach:

- A systematic program to identify, prioritize, and control invasive plants throughout the Project Area
- An opportunistic, site-specific approach to remove invasive plants from individual work sites

The intent is that these two programs, operating at different yet complimentary spatial scales will enhance the overall ecological health of the SMP's creek ecosystems. For the opportunistic portion of the program, invasive plant management will focus on controlling species that are highly invasive at individual SMP work sites.. For example, species such as giant reed, Cape ivy, Himalayan blackberry, tree of heaven, English ivy, and perennial pepperweed will be targeted for removal or control.

At the systematic program-area scale, the IPMP will develop a priority matrix of invasive plant species which integrates and weighs a variety of factors including: the 2006 CAL-IPC ratings, the anticipated rate of spread without management intervention, the feasibility of effective control, impacts to fish and wildlife, impacts to sensitive plant communities, increases in flood threat, increases to fire danger, aggressive growth patterns known to cause structural damage, and impediments to maintenance access. Priority target species will be selected annually from this matrix. The IPMP will then prioritize locations for control work where:

- the target species are degrading habitat for sensitive fish and/or wildlife species;
- invasive plant removal and subsequent native habitat colonization will improve connectivity between existing patches of high-quality habitat;
- the upstream extents of invasive plant species distribution (in the Project Area) will be targeted to reduce the potential for re-invasion of control sites via propagules dispersal from upstream source populations; and
- invasive plant control is technically feasible (e.g., because of access constraints) and can be accomplished while minimizing impacts to adjacent aquatic, wetland, and riparian habitats.

The targeted invasive species, and the location and extent of invasive species management, will be tied directly to the SMP's impacts in each habitat type, i.e., upland, riparian, freshwater and tidal wetland, so that the benefits of invasive species management will directly offset the adverse effects in these habitats. Integrated Vegetation Management techniques will be employed including mechanical, chemical, biological, and/or a combination of techniques to utilize the most effective method for each target species while providing the greatest amount of protection to environmental resources.

Invasive Plant Management Mitigation Requirement

Invasive plant management mitigation will be targeted at both on-site and off-site locations. For the larger systematic program, mitigation needs and credit will be determined annually, dependent on the proposed work for the year and the associated impacts expected to be incurred in each habitat type, i.e., upland, riparian, freshwater, and tidal wetland impacts. A proposal for mitigation credit and the associated acreage to be treated for this program will be submitted with the annual "Notice of Proposed Work."

The opportunistic effort will be variable each year dependent on the number of work sites where invasive plant removal is feasible. Mitigation credit accrued for this portion of the Program will be used to compensate for on-site vegetation impacts or for ongoing vegetation maintenance activities. Proposed mitigation credit for each project site will be submitted with the annual "Notice of Proposed Work."

Determining specific performance/success criteria would require specific information regarding the invasive plant management sites and the invasive species being managed. As a result, those specific criteria will be defined in the IPMP rather than in this SEIR. Nevertheless, the performance/success criteria described in the IPMP will guide the mitigation to manage invasive plants, adequate to compensate for impacts.

MM BIO-16 will mitigate impacts resulting from invasive plant species to less-than-significant levels by avoiding and controlling such invasions, thereby ensuring that the SMP does not substantially degrade the quality of the environment; reduce the number or restrict the range of endangered or threatened species; have a substantial adverse effect on special-status species, wetlands, or other sensitive natural communities; impede the use of nursery sites; or conflict with local or regional conservation plans as a result of such invasions.

Impact BIO-45: Habitat Fragmentation
(Significance Criterion E; Significant and Unavoidable)

For many species, the landscape is a mosaic of suitable and unsuitable habitat types. Environmental corridors are segments of land that provide a link between these different habitats while also providing cover. On a broader level, corridors also function as avenues along which wide-ranging animals can travel, plants can propagate, genetic interchange can occur, populations can move in response to environmental changes and natural disasters, and threatened species can be replenished from other areas. In the Project Area, the vegetation communities along streams and rivers often function as environmental corridors in providing habitat for a variety of resident wildlife species.

Proposed stream maintenance activities could alter these communities and corridors by breaking them into smaller, disjunct pieces, a process known as fragmentation. The impact of fragmentation on wildlife is twofold: first, as habitat patches become smaller they are unable to support as many individuals (patch size); and second, the area between habitat patches may be unsuitable for wildlife species to traverse (connectivity).

Proposed Project activities could impact both patch size and connectivity when all vegetation was removed over long reaches or vegetation structure and composition was changed in a way that would create barriers to wildlife movement. By creating open area

or patches with unsuitable vegetation types, these activities could restrict some wildlife species from moving between distant patches or could temporarily eliminate a local population. Because of the urban and agricultural context in which many creeks in the Project Area occur, the riparian, aquatic, and wetland habitats along these creeks represent the only (or at least highest-quality) habitat available to many species on the Valley floor. As a result, the fragmentation effects of Proposed Project activities combined with adverse effects of urbanization and other land uses could bring about a cumulative impact on habitat connectivity for plants and animals.

Common wildlife species found in locations that are projected for sediment removal and/or vegetation management work sites, or that occur in areas where unprojected activities (e.g., bank stabilization, management of animal conflicts, sediment reuse/disposal, and minor maintenance) may occur, may be somewhat acclimated to existing conditions as they have been caused by SMP maintenance activities ongoing from 2002. However, over the 10-year span of the proposed SMP Update, local populations of some wildlife species may not be able to recover from the impacts of fragmentation and small, localized populations may be lost. Proposed Project activities that reduced cover for dispersing individuals, such as "limbing up" and removal of understory vegetation, could inhibit the recolonization of areas from which species have been extirpated for all but the more mobile species (e.g., birds). Local losses may be significant when evaluated across the entire Project Area.

Implementation of pre-project planning BMPs would reduce the impact of habitat fragmentation by minimizing the extent of maintenance activities and designing individual activities to result in the least impact to stream channels as practicable. These BMPs are as follows, and a description of each is provided in Table 2-12.

Applicable Best Management Practices

BMP GEN-4: Minimize the Area of Disturbance
BMP BANK-1: Bank Stabilization Design to Prevent Erosion Downstream

Conclusion

Implementation of these BMPs would reduce the potential habitat fragmentation caused by the Proposed Project. Likewise, the compensatory mitigation package partially would compensate for fragmentation impacts by providing habitat that could either help to fill gaps in habitat outside the impact area (e.g., resulting from riparian or wetland restoration in areas that formerly lacked such habitat) or by boosting the sizes of populations that may be adversely affected by habitat loss and fragmentation.

Adverse effects from fragmentation, however, may remain for those species that could not easily move to undisturbed areas or mitigation sites. The cumulative effect of fragmentation also must be viewed in the context of other activities. With increasing development in Santa Clara County, creeks are becoming the last refuge for some wildlife species. Over the next 10 years, the combination of continued stream maintenance and development of surrounding uplands may result in some local wildlife populations dropping below a self-sustaining level on some creek sections. Thus, the impact of SMP activities on habitat connectivity and movement of some wildlife species would be significant (Significance Criterion E).

Because the impacted species would occur in the very locations where flood protection was being maintained, the impact would occur at many stream locations throughout the county, and some very localized populations may drop below a self-sustaining level that could not be completely mitigated off-site, habitat fragmentation caused by proposed stream maintenance activities from 2012–2022 would be considered a **significant and unavoidable impact** even with implementation of BMPs and habitat mitigation measures.

Impact BIO-46: Conflicts with Adopted Habitat Conservation Plans or Natural Community Conservation Plans (Significance Criterion F; Less than Significant)

SCVWD is an applicant on two Habitat Conservation Plans (HCPs): the *Santa Clara Valley Habitat Plan* (an HCP/natural community conservation plan [NCCP]) and the *Three Creeks Habitat Conservation Plan*.

Santa Clara Valley Habitat Plan. The Santa Clara Valley Habitat Plan is being pursued by SCVWD along with five other local partners (the County of Santa Clara, the Santa Clara Valley Transportation Authority, and the cities of San Jose, Gilroy, and Morgan Hill) and two resource agencies (the CDFG and USFWS). The Santa Clara Valley HCP/NCCP is "intended to provide an effective framework to protect, enhance, and restore natural resources in specific areas of Santa Clara County, while improving and streamlining the environmental permitting process for impacts on threatened and endangered species" (ICF Jones & Stokes 2010). As it relates to biological resources and conservation, this plan is designed to "protect, enhance, and restore ecosystem integrity and functionality for threatened and endangered species; enhance the diversity of plant and animal communities; and conserve habitat and contribute to the recovery of species listed or likely to be listed under the federal ESA or the California ESA."

A number of plant and animal species are proposed for coverage under the plan. Approval of impacts to covered species from project activities covered by the plan (i.e., projects that meet a number of criteria concerning location, proponent, and type) will be considerably expedited. Fees paid in accordance with the extent and nature of projects' impacts will be used to further conservation efforts via the acquisition, creation, or enhancement, as well as the preservation and management, of habitat for these species. In addition, covered projects are subject to a number of measures concerning avoidance and minimization of impacts to covered species and habitats through project design and construction measures (such as pre-construction species surveys and seasonal restrictions on construction activities) to directly protect species. Several "no take" species also exist that, because of their rarity or regulatory status (e.g., state fully protected species), cannot be "taken" by a project that is covered by the plan.

The process of developing the Santa Clara Valley HCP/NCCP is ongoing and scheduled to be completed in 2011 or 2012. The public draft plan, the draft EIR/EIS, and the draft Implementing Agreement were released on December 17, 2010. Although not yet adopted, a draft preferred conservation strategy has been identified. Key elements of the preferred conservation strategy for Santa Clara County for the next 50 years include:

- Land Acquisition: Preserve and enhance in perpetuity, approximately 45,000 acres of new land obtained from willing sellers through acquisition of fee title and conservation easements

- Enhance Existing Park and Open Space: In addition to new land acquisitions, incorporate approximately 13,000 acres of high-value species habitat in existing open space into the Reserve System
- Protect more than 100 miles of streams
- Preserve important linkages between key areas of habitat and existed protected areas
- Establish a system by which long-term management of the Reserve System and streams would occur to maintain biodiversity and populations of covered species
- Restore or create at least 90 acres, and possibly up to 566 acres, of riparian woodland, ponds, and wetlands to compensate for impacts to these habitat types and contribute to the conservation and recovery of covered species
- Restore at least 1 mile, and possibly up to 12.6 miles, of streams to compensate for impacts to streams and contribute to the conservation and recovery of covered species

SCVWD's Proposed Project activities, except for maintenance of the Almaden Calero canal, are not considered covered activities under the Santa Clara Valley HCP/NCCP. Maintenance of the Almaden Calero Canal is expected to be covered by the Santa Clara Valley HCP/NCCP and the Three Creeks HCP when those HCPs are adopted. The Santa Clara Valley HCP/NCCP plan was consulted in the preparation of this document, and many elements of the SMP Update are consistent with the plan. For example, information on the known and potential occurrences of special-status species and habitat types contained in the draft plan were consulted during the preparation of this biological resources section for the SMP Update DSEIR. In addition, the BMPs and other elements of the conservation strategy of the plan were consulted in determining appropriate BMPs and mitigation measures for Proposed Project activities.

Neither the Santa Clara Valley HCP/NCCP nor the Three Creeks HCP have been adopted. Therefore, the SMP Update SEIR would not be in conflict with an adopted Santa Clara Valley Habitat Plan.

Three Creeks Habitat Conservation Plan (HCP). This HCP, being proposed by SCVWD, involves a number of large capital projects pertaining to SCVWD's dams and water supply operations. It includes: the operation and maintenance of eight SCVWD reservoirs; the seismic retrofit of Almaden, Anderson, Calero, Guadalupe, and Vasona dams; the development of borrow sites for these retrofit projects; and the operation and maintenance of a number of diversion dams, drop structures, fish screens, fish ladders, recharge ponds, and other water-supply facilities. In addition, this HCP includes a number of activities intended to enhance habitat conditions for steelhead and Chinook salmon. These activities include:

- Geomorphic rehabilitation
- Lake Almaden fish passage
- Instream habitat enhancement
- Reservoir and recharge re-operation
- Upper Penitencia Creek management program
- Supplemental flow program

- Monitoring program

Except for maintenance of the Almaden Calero Canal, which is expected to be covered by the Three Creeks HCP and the Santa Clara Valley HCP/NCCP, Proposed Project activities are not considered covered activities under this HCP. In addition, these HCPs have not yet been adopted. Therefore, the SMP Update SEIR would not be in conflict with an adopted HCP. Nevertheless, the HCP was consulted in the preparation of the SMP Update DSEIR, and many elements of the SMP Update are consistent with the HCP.

Other HCPs and NCCPs. Only two other HCPs have been approved in Santa Clara County (USFWS 2011):

- PG&E's Metcalf-El Patio, Metcalf-Hicks/Vasona HCP, covering the Bay checkerspot butterfly on Tulare Hill and the Santa Teresa Hills
- Zanker Road Resource Management's HCP, covering the salt marsh harvest mouse in Alviso

The Proposed Project does not include any activities that conflict with these HCPs. Aside from the *Santa Clara Valley Habitat Plan*, no NCCPs in Santa Clara County have been approved or are in preparation (CDFG 2011).

Conclusion

Therefore, the Proposed Project would not conflict with any adopted HCPs or NCCPs, or with any other approved local, regional, or state habitat conservation plans, and thus the impact associated with conflicts between the SMP Update and any adopted HCP or NCCP would be less than significant. No mitigation would be required.

Impact BIO-47: Resuspension of Mercury
(Significance Criteria A, B, C, and D; Less than Significant)

Proposed Project maintenance activities involving ground disturbance, such as sediment removal and bank stabilization, could potentially mobilize mercury-contaminated sediments, which are already present within stream channels in the Guadalupe River Basin (see Section 3.6. *Hazards and Hazardous Materials*, and Section 3.13, *Water Quality*). Proposed maintenance activities would not contribute additional contamination in stream channels. Furthermore, over the 10-year implementation period, the Proposed Project would remove significant quantities of sediment contaminated with mercury. Nevertheless, mobilization of mercury-contaminated sediment could occur during sediment removal or bank stabilization activities conducted within the Guadalupe River watershed. The 2006 Clean Water Act, Section 303(d), *List of Water Quality Limited Segments* lists Alamitos Creek, Guadalupe Creek, and the Guadalupe River as mercury-impaired waterbodies, as mercury mobilized from mines upstream has entered these waterbodies. Thus, proposed maintenance activities involving ground disturbance in and along these creeks may mobilize mercury present in sediments in their banks and beds, potentially allowing for the transport of mercury to areas downstream from the bank stabilization site.

Mercury is a toxic constituent that bioaccumulates in the food chain of aquatic organisms and terrestrial wildlife. Effects of methylmercury exposure on wildlife can include mortality (death), reduced fertility, slower growth and development, and abnormal

behavior that affects survival, depending on the level of exposure (Scheuhammer et al. 2007, USEPA 2010). Because the SMP Update would only incrementally increase the availability of mercury in the Guadalupe River system, where mercury already would be prevalent, Proposed Project impacts on mercury availability possibly would not be very high. Nevertheless, because of the value of the Guadalupe River watershed to numerous species of fish and wildlife and the potentially far-reaching effects of mercury mobilization on fish, birds, mammals, and other organisms, this impact could have substantial effects on populations of these species.

To minimize the potential incremental increase in mercury availability resulting from Proposed Project activities, SCVWD would implement the following BMPs. A description of each BMP is provided in Table 2-12.

Applicable Best Management Practices

BMP GEN-3 Avoid Exposing Soils with High Mercury Levels
BMP GEN-4 Minimize the Area of Disturbance
BMP GEN-20: Erosion and Sediment Control Measures
BMP GEN-27 Existing Hazardous Sites
BMPs SED-1: Groundwater Management
BMP SED-2: Prevent Scour Downstream of Sediment Removal

Conclusion

Collectively, by implementing these BMPs, the impact to wildlife and fish as result of mercury mobilization would be less than significant. No mitigation would be required.

Table 3.3-~~20~~21. Special-Status Plant Species, Their Status, Habitat Description, and Potential for Occurrence in the Project Area

Common Name	Scientific Name	Status	General Habitat Description[1]	Potential for Occurrence in the Project Area	Potential for Occurrence in the Proposed Project Footprint
Federal or State-Endangered and Threatened Species					
Tiburon paintbrush	*Castilleja affinis* ssp. *neglecta*	FE, ST, CNPS List 1B.2, HCP	Valley and foothill grassland (serpentinite)/ serpentine bunchgrass grassland	**Present.** Documented occurrences in the Project Area on Coyote Ridge between Anderson Reservoir and U.S. Highway 101. Potential habitat includes serpentine bunchgrass grasslands located on the northern portion of Coyote Ridge and portions of the Santa Teresa Hills.	**Unlikely to Occur.** SCVWD **s**urveys for special-status plants along all creeks and canals mapped on serpentine soils in the Project Area in 2004 and 2008 did not detect any occurrences of Tiburon paintbrush. Therefore, a low probability would exist that it would occur in close proximity to any Proposed Project activities.
Coyote ceanothus	*Ceanothus ferrisiae*	FE, CNPS List 1B.1, HCP	Chaparral, coastal scrub, valley and foothill grassland on serpentinite/serpentine bunchgrass grassland and mixed serpentine chaparral	**Present.** Three populations recorded in the Anderson Reservoir area, within the south-central portion of the Project Area. A fourth population is located near Morgan Hill off Llagas Road and Old Monterey Road. The species may also occur on serpentine soils on northern Coyote Ridge and portions of the Santa Teresa Hills.	**Unlikely to Occur.** SCVWD surveys for special-status plants along all creeks and canals mapped on serpentine soils in the Project Area in 2004 and 2008 did not detect any occurrences of Coyote ceanothus away from known locations. Therefore, this species is not expected to occur in or very near any Proposed Project work sites.
Santa Clara Valley dudleya	*Dudleya setchellii*	FE, CNPS List 1B.1, HCP	Cismontane woodland, valley and foothill grassland on serpentinite, rocky/ serpentine rock outcrop	**Present.** Occurs in numerous locations in the Project Area on serpentine rock outcrops, including the Santa Teresa Hills, Communications Hill, near Monterey Road/Senter Road, Coyote Ridge, near Anderson Reservoir, and in the upper Llagas Creek watershed. Although many populations have been documented in the Project Area, much of the suitable habitat has not been surveyed as it occurs on private lands. Potential habitat occurs elsewhere on serpentine soils in the lower foothills of the Santa Cruz Mountains and the Diablo Range.	**Present.** SCVWD surveys in 2004 and 2008 documented the Santa Clara Valley dudleya on the Coyote Canal Extension, Coyote Alamitos Canal, and Almaden Calero Canal.

Table 3.3-~~20~~21. Special-Status Plant Species, Their Status, Habitat Description, and Potential for Occurrence in the Project Area

Common Name	Scientific Name	Status	General Habitat Description[1]	Potential for Occurrence in the Project Area	Potential for Occurrence in the Proposed Project Footprint
Metcalf Canyon jewel-flower	*Streptanthus albidus* ssp. *albidus*	FE, CNPS List 1B.1, HCP	Valley and foothill grassland (serpentinite)/ serpentine bunchgrass grassland	**Present.** The majority of the Metcalf Canyon jewel-flower's range is considered to occur in the Project Area. The species occurs on serpentine soils on Coyote Ridge and near Anderson Reservoir in the Project Area, on Communication Hill, and off Llagas Rd, in Morgan Hill. Some uncertainty exists around the taxonomic treatment of this species and most beautiful jewel-flower, but potentially suitable habitat is present north of Alum Rock, in the Santa Teresa Hills, west of Coyote Valley, along Coyote Ridge, on Communications Hill, and perhaps in a serpentine outcrop near Monterey Road and Senter Road.	**Present.** Metcalf Canyon jewel-flower was observed on the Coyote Canal Extension during SCVWD's 2004 and 2008 surveys.
CNPS-listed Species					
Franciscan onion	*Allium peninsulare* var. *franciscanum*	CNPS List 1B.2	Cismontane woodland, valley and foothill grassland on clay, volcanic soils, often serpentinite/oak woodland	**May be Present.** No populations are described as occurring in the Project Area. The closest known population occurs off Page Mill Road in Palo Alto, but suitable habitat exists in the Project Area in oak woodland habitats, such as those in the Santa Teresa and Almaden Hills.	**May be Present.** No known occurrences in the Proposed Project footprint or wider Project Area, but suitable habitat may be present.
Bent-flowered fiddleneck	*Amsinckia lunaris*	CNPS List 1B.2	Coastal bluff scrub, cismontane woodland, valley and foothill grassland/oak woodland and chaparral	**May be Present.** No known occurrences are in the Project Area. One population described from Santa Clara County on Kinkaid Road 1.1 miles north of Mt. Hamilton Road, outside of the Project Area. However, suitable habitat is present at similar elevations in the Project Area in chaparral and oak woodland habitats, particularly in the western portion of the Project Area near the Almaden Hills and near Llagas Creek.	**May be Present.** No known occurrences in the Proposed Project footprint or wider Project Area, but suitable habitat may be present.

Table 3.3-~~20~~21. Special-Status Plant Species, Their Status, Habitat Description, and Potential for Occurrence in the Project Area

Common Name	Scientific Name	Status	General Habitat Description[1]	Potential for Occurrence in the Project Area	Potential for Occurrence in the Proposed Project Footprint
Anderson's manzanita	*Arctostaphylos andersonii*	CNPS List 1B.2	Broadleafed upland forest, chaparral, and North Coast coniferous forest habitats (openings) at elevations of 197 to 2,395 feet	**May be Present.** Eight documented populations occur above 1,000 feet in elevation in the Santa Cruz mountains, outside of the Project Area. However, potential habitat is present in the foothills toward the eastern and western edges of the Project Area.	**May be Present.** No known occurrences in the Proposed Project footprint or wider Project Area, but suitable habitat may be present.
Brittlescale	*Atriplex depressa*	CNPS List 1B.2	Chenopod scrub, meadows and seeps, playas, valley and foothill grasslands, and vernal pools on alkaline, clay soils/California annual grassland habitat on alkaline soil, seasonal wetlands	**May be Present.** Closest known occurrence is in baylands north of Mud Slough in similar habitat to that occurring south and southwest of the Water Pollution Control Plant (WPCP) in the Project Area. Though no occurrences are in the Project Area, suitable habitat is present on low lying moist, alkaline, clay soils near the bay, where the species may be present.	**May be Present.** No known occurrences in the Proposed Project footprint or wider Project Area, but suitable habitat may be present.
Big-scale balsamroot	*Balsamorhiza macrolepis* var. *macrolepis*	CNPS List 1B.2, HCP	Chaparral, cismontane woodland, valley and foothill grassland sometimes in serpentinite/serpentine bunchgrass grassland, mixed serpentine chaparral, and oak woodland	**Present.** One extirpated historical occurrence from east of Coyote Creek in the Project Area, and one extant occurrence near the northern portion of Coyote Ridge. Additional suitable habitat in the Project Area includes serpentine soils, such as those on Coyote Ridge and the Santa Teresa Hills, along the foothills.	**Unlikely to Occur.** SCVWD surveys for special-status plants along all creeks and canals mapped on serpentine soils in the Project Area in 2004 and 2008 did not detect any occurrences of big-scale balsamroot. Therefore, this species is not expected to occur in or very near any Proposed Project work sites.
Round-leaved filaree	*Erodium macrophyllum*	CNPS List 1B.1	Cismontane woodland, valley and foothill grassland/in California annual grassland and oak woodland habitat on clay soils	**Present.** There are nine records for round-leaved filaree in the Project Area. Suitable habitat occurs on clay soils in the foothills of the Santa Cruz Mountains and the Diablo Range.	**May be Present.** Suitable habitat may be present in the Proposed Project footprint.

Table 3.3-~~20~~21. Special-Status Plant Species, Their Status, Habitat Description, and Potential for Occurrence in the Project Area

Common Name	Scientific Name	Status	General Habitat Description[1]	Potential for Occurrence in the Project Area	Potential for Occurrence in the Proposed Project Footprint
Pink creamsacs	*Castilleja rubicundula* ssp. *rubicundula*	CNPS List 1B.2 , HCP No Take	Chaparral (openings), cismontane woodland, meadows and seeps, valley and foothill grassland on serpentinite/oak woodland, serpentine bunchgrass grassland	**Present.** Recorded approximately 4.5 miles south of Gilroy in the Project Area. Suitable habitat also is present on serpentine soils such as those along Coyote Ridge, within the Santa Teresa Hills, near Anderson Reservoir, west of Coyote Valley, within Communications Hill (although it has not been found there in surveys), and within the area of serpentine north of Alum Rock.	**Unlikely to Occur.** SCVWD surveys for special-status plants along all creeks and canals mapped on serpentine soils in the Project Area in 2004 and 2008 did not detect any occurrences of pink creamsacs. Therefore, this species is not expected to occur in or very near any Proposed Project work sites.
Congdon's tarplant	*Hemizonia parryi* ssp. *congdonii*	CNPS List 1B.2	Valley and foothill grassland (alkaline)/ California annual grassland habitat on alkaline soils	**Present.** Five recorded populations in the Project Area in the Warm Springs region of Fremont and in Alviso. The species may occur in disturbed areas on alkaline soils and may occur in disturbed California annual grassland habitat near seasonally wet habitat, specifically in the northern reaches of the Project Area near Alviso.	**May be Present.** Suitable habitat may be present in the Proposed Project footprint.
Mt. Hamilton thistle	*Cirsium fontinale* var. *campylon*	CNPS List 1B.2, HCP	Chaparral, cismontane woodland, valley and foothill grassland in serpentinite seeps/ serpentine seeps	**Present.** Numerous recorded populations exist in the Project Area. It is found near the Almaden Calero Canal, Coyote Canal, Coyote Canal Extension, Silver Creek, Metcalf Canyon, Anderson Dam spillway, Coyote Creek tributaries, springs east of Coyote Creek, drainages between Kirby Canyon landfill, and Coyote Creek golf course, drainage near Almaden Research Center, north Calero Reservoir in a tributary to Arroyo Creek, and others. Suitable habitat is present elsewhere on mesic serpentine habitat, such as seeps and swales throughout the foothills in the central portion of the Project Area.	**Present.** Mt. Hamilton thistle was detected on the Almaden Calero Canal and the Coyote Canal during SCVWD's 2004 survey, and on the Coyote Canal and Coyote Canal Extension in 2008.

Table 3.3-~~20~~21. Special-Status Plant Species, Their Status, Habitat Description, and Potential for Occurrence in the Project Area

Common Name	Scientific Name	Status	General Habitat Description[1]	Potential for Occurrence in the Project Area	Potential for Occurrence in the Proposed Project Footprint
Santa Clara red ribbons	*Clarkia concinna* ssp. *automixa*	CNPS List 4.3	Chaparral, cismontane woodland/chaparral, oak woodland; slopes near drainages	**Present.** This CNPS list 4.3 species has a narrow endemic range that has been reduced to Santa Clara and Alameda counties. Three of 17 records in Santa Clara County are below 1,000 feet elevation and within the Project Area. Suitable habitat exists in chaparral and oak woodland habitats in the upper limits of the Project Area, in the foothills of the Santa Cruz Mountains and the Diablo Range.	**May be Present.** Suitable habitat may be present in the Proposed Project footprint.
San Francisco collinsia	*Collinsia multicolor*	CNPS List 1B.2, HCP	Closed-cone coniferous forest, coastal scrub, sometimes serpentinite	**Present.** One population documented near Stanford University was last reported in 1903. A second occurrence, listed in Edenvale, is located in the Project Area. However, this population was recorded in an area that has since been developed and was last observed in 1961. A new occurrence was observed by SCVWD botanist J. Hillman (pers. comm.) in 2009, on the shoreline of Anderson Reservoir, and another occurrence was reported in Almaden/ Quicksilver Park (outside of the Project area) in 2001 (though this occurrence has not been relocated).	**May be Present.** SCVWD surveys for special-status plants along all creeks and canals mapped on serpentine soils in the SMP Project Area in 2004 and 2008 did not detect any occurrences of San Francisco collinsia. However, the SCVWD did document an occurrence along the shoreline of Anderson Reservoir in 2009, and the majority of occurrences are not located on serpentine soils. Thus, some potential exists for the species to occur in or near activity areas.
Hospital Canyon larkspur	*Delphinium californicum ssp. interius*	CNPS List 1B.2	The species is found in chaparral and cismontane woodland habitats at elevations of approximately 760–3,615 feet	**May be Present.** Inhabits a small endemic range covering the mid- and upper elevations of the inner Coast Ranges along the San Francisco Bay Area and south towards Mount Hamilton. Potential habitat occurs toward the upper elevations of the Project Area in the Diablo Range, in wet, boggy meadows, canyons, and chaparral openings.	**May be Present.** Suitable habitat may be present in the Proposed Project footprint.

Table 3.3-~~20~~21. Special-Status Plant Species, Their Status, Habitat Description, and Potential for Occurrence in the Project Area

Common Name	Scientific Name	Status	General Habitat Description[1]	Potential for Occurrence in the Project Area	Potential for Occurrence in the Proposed Project Footprint
Western leatherwood	*Dirca occidentalis*	CNPS List 1B.2	Mesic broadleafed upland forest, closed-cone coniferous forest, chaparral, cismontane woodland, North Coast coniferous forest, riparian forest, and riparian woodland habitats from 164–1,296 feet in elevation	**Present.** Four occurrences have been documented in the northeastern portion of the Project Area, and these are presumed extant. Potential habitat occurs in the foothills of the Santa Cruz mountains, in the foothills along the northeastern edge of the Project Area.	**May be Present.** Suitable habitat may be present in the Proposed Project footprint.
Hoover's button-celery	*Eryngium aristulatum* var. *hooveri*	CNPS List 1B.1	Vernal pools/California annual grassland habitat on alkaline soil, seasonal wetland	**May be Present.** Several historical occurrences of the species have been reported in the Project Area. However, all occurrences in Santa Clara County have been extirpated by development, except one located in the vicinity of San Felipe Lake at the southern border of the county. Habitat of a suitable quality may be present in alkaline depressions, vernal pools, or roadside ditches along the south San Francisco Bay near Alviso.	**May be Present.** Suitable habitat may be present in the Proposed Project footprint.
Talus fritillary	*Fritillaria falcata*	CNPS List 1B.2	Serpentinite, often talus-based soils in chaparral, cismontane woodland, and lower montane coniferous forest habitats from 984–5,003 feet in elevation	**Absent.** No documented occurrences in the Project Area. The last documented observation was in Blackbird Valley, a tributary to Arroyo Colorado Creek, in 1995. This was at 3,000 feet in elevation and outside of the Project Area. The species is presumed absent.	**Absent.** Out of range; no suitable habitat.

Table 3.3-~~20~~21. Special-Status Plant Species, Their Status, Habitat Description, and Potential for Occurrence in the Project Area

Common Name	Scientific Name	Status	General Habitat Description[1]	Potential for Occurrence in the Project Area	Potential for Occurrence in the Proposed Project Footprint
Fragrant fritillary	*Fritillaria liliacea*	CNPS List 1B.2, HCP	Cismontane woodland, coastal prairie, coastal scrub, valley and foothill grassland, often in serpentinite/oak woodland, serpentine bunchgrass grassland	**Present.** Six populations have been documented in various locations in the Project Area. Additional suitable habitat occurs on serpentine soils in the Project Area, such as Coyote Ridge, Anderson and Calero Reservoirs, west of Coyote Valley, the Santa Teresa Hills, Communications Hill, and serpentine north of Alum Rock.	**Unlikely to Occur.** SCVWD surveys for special-status plants along all creeks and canals mapped on serpentine soils in the Project Area in 2004 and 2008 did not detect any occurrences of fragrant fritillary. Therefore, this species is not expected to occur in or very near any Proposed Project work sites.
Loma Prieta hoita	*Hoita strobilina*	CNPS List 1B.1, HCP	Chaparral, cismontane woodland, riparian woodland, usually serpentinite/mesic mixed serpentine chaparral, serpentine seeps	**Present.** Numerous records in the Project Area from serpentine soils predominantly in the Santa Cruz mountains from Saratoga to Gilroy, but also in the Diablo range near the Coyote Ridge. Suitable habitat is present in the Project Area in riparian areas, particularly mesic-serpentine influenced soils of the Santa Cruz mountains.	**May be Present.** Known occurrences on several creeks in the Project Area suggest the possibility that this species may occur within Proposed Project work sites.
Satan's goldenbush	*Isocoma menziesii* var. *diabolica*	CNPS List 4.2	Cismontane woodland/oak woodland	**Present.** The species is only documented in Santa Clara and San Benito counties. It occurs in the Project Area in the foothills near the Almaden Hills. Suitable habitat is present in the foothills where oak woodland habitat occurs in the Santa Teresa Hills, the Almaden Hills, near Anderson Reservoir, and along Coyote Ridge.	**May be Present.** Suitable habitat may be present in the Proposed Project footprint.
Woolly-headed lessingia	*Lessingia hololeuca*	CNPS List 3	Clay and serpentinite soils in broadleafed upland forest, coastal scrub, lower montane coniferous forest, and valley and foothill grassland habitats from 49–1,000 feet in elevation	**Present.** Two records exist from the Project Area, one from the foothills west of Los Gatos and one from an area north of Gilroy. Potential habitat exists in the Project Area on serpentine soils in the foothills of the Santa Cruz Mountains.	**Unlikely to Occur.** SCVWD surveys for special-status plants along all creeks and canals mapped on serpentine soils in the Project Area in 2004 and 2008 did not detect any occurrences of wooly-headed lessingia. Therefore, this species is not expected to occur in or very near any Proposed Project work sites.

Table 3.3-~~20~~21. Special-Status Plant Species, Their Status, Habitat Description, and Potential for Occurrence in the Project Area

Common Name	Scientific Name	Status	General Habitat Description[1]	Potential for Occurrence in the Project Area	Potential for Occurrence in the Proposed Project Footprint
Smooth lessingia	*Lessingia micradenia* var. *glabrata*	CNPS List 1B.2, HCP	Chaparral, cismontane woodland- on serpentinite, often roadsides/mixed serpentine chaparral and oak woodland	**Present.** There are 27 records in the Project Area throughout the foothills in the central and southern portions of the county, in both the Santa Cruz Mountains and the Diablo Range. Suitable habitat is present on rocky slopes and roadsides in serpentine derived soils throughout the central and southern foothills of Santa Clara County.	**Present.** Smooth lessingia was observed on the Almaden Calero Canal, Coyote Alamitos Canal, Coyote Canal, and Coyote Canal Extension during SCVWD's 2004 and 2008 surveys.
Showy golden madia	*Madia radiata*	CNPS List 1B.1	Cismontane woodland and valley and foothill grassland habitats from 82–2,953 feet in elevation	**May be Present.** Only documented occurrence in Santa Clara County is from an elevation of 2,200 feet, outside the Project Area. Potential habitat exists within the Project Area in the foothills on clay soils.	**May be Present.** Suitable habitat may be present in the Proposed Project footprint.
Davidson's bush-mallow	*Malacothamnus davidsonii*	CNPS List 1B.2	Chaparral, cismontane woodland, coastal scrub, riparian woodland/ chaparral, oak woodland, mixed riparian forest and woodland	**May be Present.** Three historical records exist from near Stanford and Los Altos, dating from 1936. Suitable habitat is present in the woodland and riparian habitats of the foothills of the Santa Cruz Mountains, on sandy substrates.	**May be Present.** No extant records in the Project Area; however, suitable habitat is present.
Hall's bush-mallow	*Malacothamnus hallii*	CNPS List 1B.2, HCP	Chaparral, coastal scrub/ chaparral	**Present.** Numerous records of the species exist from the Project Area, in the Santa Teresa Hills and along Coyote Ridge. Additional suitable habitat is present in the foothills of the Santa Cruz Mountains and the Diablo Range.	**Present.** Hall's bush-mallow was observed on the Coyote Canal Extension during SCVWD's 2004 and 2008 surveys.
Oregon meconella	*Meconella oregana*	CNPS List 1B.1	Coastal prairie and coastal scrub communities at elevations from 820–2,034 feet	**May be Present.** Three occurrences were recorded in Santa Clara County as recently as 2005. All are in the same location near the summit of Mt. Hamilton. Potential habitat may occur in the upper reaches of the Project Area (above 820 feet in elevation) in the Diablo Range.	**May be Present.** No known occurrences in the Proposed Project footprint or wider Project Area, but suitable habitat may be present.

Table 3.3-~~20~~21. Special-Status Plant Species, Their Status, Habitat Description, and Potential for Occurrence in the Project Area

Common Name	Scientific Name	Status	General Habitat Description[1]	Potential for Occurrence in the Project Area	Potential for Occurrence in the Proposed Project Footprint
Mt. Diablo cottonweed	*Micropus amphibolus*	CNPS List 3.2	Broad-leafed upland forest, chaparral, cismontane woodland, valley and foothill grassland in rocky habitat/oak woodland, chaparral, California annual grassland	**Present.** One record of the species exists in the Project Area from a location west of Campbell. Suitable habitat occurs within rocky oak woodland habitat in the Santa Cruz Mountains and the Diablo Range.	**May be present.** Suitable habitat may be present in the Proposed Project footprint.
Robust monardella	*Monardella villosa* ssp. *globosa*	CNPS List 1B.2, HCP	Broad-leafed upland forest (openings), chaparral (openings), cismontane woodland, coastal scrub, valley and foothill grassland/chaparral, oak woodland, and California annual grassland	**Present.** Five records exist for the species in the Project Area. These predominantly occur in Almaden Quicksilver County Park, Rancho San Antonio Open Space Preserve, and Lexington Reservoir County Park. Suitable habitat is present in the Project Area, particularly in the foothills of the Santa Cruz Mountains and the Diablo Range.	**May be Present.** Suitable habitat may be present in the Proposed Project footprint.
Hooked popcorn-flower	*Plagiobothrys uncinatus*	CNPS List 1B.2	Valley and foothill grasslands, cismontane woodlands, and chaparral habitats (sandy soils) at elevations of approximately 990–2,510 feet; across all habitat types often associated with canyon slopes	**May be Present.** No documented populations exist in the Project Area. Potential habitat exists in sandy soils at higher elevations in the foothills bordering the Project Area.	**May be Present.** No known occurrences in the Proposed Project footprint or wider Project Area, but suitable habitat may be present.
Most beautiful jewel-flower	*Streptanthus albidus* ssp. *peramoenus*	CNPS List 1B.2, HCP	Chaparral, cismontane woodland, valley and foothill grassland in serpentinite/ serpentine bunchgrass grassland, mixed serpentine chaparral	**Present.** Numerous populations are recorded in the Project Area along Coyote Ridge, near Anderson and Calero Reservoirs, and the Santa Teresa Hills. In addition, suitable habitat is present in the Project Area on serpentine soils such as those on Communications Hill and the serpentine habitat area near Alum Rock.	**Present.** Most beautiful jewel-flower was observed on the Almaden Calero Canal and Coyote Canal during SCVWD's 2004 and 2008 surveys.

Table 3.3-~~20~~21. Special-Status Plant Species, Their Status, Habitat Description, and Potential for Occurrence in the Project Area

Common Name	Scientific Name	Status	General Habitat Description[1]	Potential for Occurrence in the Project Area	Potential for Occurrence in the Proposed Project Footprint
Saline clover	*Trifolium depauperatum* var. *hydrophilum*	CNPS List 1B.2	Mesic, alkaline, or saline sites in valley and foothill grassland habitat, in vernal pool habitat, or in marshes and swamps at elevations from 0–984 feet; occurs in both coastal and inland marshes (Hickman 1993)	**Present.** The nearest documented occurrences are between Millers Canal and the Pajaro River off Highway 125 near the San Benito County and Santa Clara County line. Suitable habitat in the Project Area would be mesic-alkaline soils in vernal pools, marshes and swamps, and grasslands, such as those near Alviso and the Pajaro River.	**May be Present.** No known occurrences in the Proposed Project footprint or wider Project Area, but suitable habitat may be present.

Key to Abbreviations:
Status: Federal Endangered (FE); State Endangered (SE); State Threatened (ST); State Protected (SP); State Rare (SR); California Native Plant Society (CNPS).

Note:
The terms used to describe the general habitat descriptions in this column include the CNPS habitat designations separated by a slash (/) from the terms describing natural communities and habitats in this existing conditions report (i.e., CNPS habitats/existing conditions habitats).

Source: Data compiled by Horizon Water and Environment in 2011

Table 3.3-~~21~~22. Special-Status Animal Species, Their Status, Habitat Description, and Potential for Occurrence in the Project Area

Name	Status	Habitat	Potential for Occurrence in the Project Area
Federal or State Endangered, Threatened, or Candidate Species			
Bay checkerspot butterfly (*Euphydryas editha bayensis*)	FT	Native grasslands on serpentine soils. Larval host plants are *Plantago erecta* and/or *Castilleja* sp.	**Present.** Occurs within the Project Area in serpentine bunchgrass grasslands and serpentine rock outcrop/barrens on the east side of the Santa Clara Valley from Coyote Ridge south to Harvey Bear Ranch and on the west side of the valley from the Santa Teresa Hills south to San Martin.
Green sturgeon (*Acipenser medirostris*)	FT, CSSC	Spawns in large river systems such as the Sacramento River; forages in nearshore oceanic waters, bays, and estuaries.	**May be Present.** Known to occur in San Francisco Bay, apparently occurs in the South Bay very rarely as a non-breeding visitor. May occur in the tidal reaches of sloughs in the Alviso area within the Project Area, albeit infrequently and in low numbers, if at all. Does not spawn in the South Bay. Likely occurs only irregularly and in low numbers in the Project Area because of the very limited abundance of the species in the vicinity and limited extent of Project activities proposed in tidal habitats.
Longfin smelt (*Spirinchus thaleichthys*)	ST	Spawns in fresh water in the upper end of the San Francisco Bay; occurs year-round in the South Bay.	**May be Present.** Occurs in the South Bay year-round (Wernette 2000), and has been collected in Alviso Slough (EDAW 2007) and in the Island Ponds between Coyote Slough and Mud Slough (Hobbs 2011). May be present in the tidal reaches of other sloughs in the South Bay as a rare non-breeding visitor, but in very low numbers. Does not spawn in the Project Area, and the species is likely to occur only in low numbers in the Project Area because of the very limited abundance of the species in the vicinity and limited extent of activities proposed in tidal habitats.
Central California coast steelhead (*Oncorhynchus mykiss*)	FT	Cool streams with suitable spawning habitat and conditions allowing migration between spawning and marine habitats.	**Present.** Known to occur in the Project Area in a number of streams flowing into San Francisco Bay, including Coyote Creek, Upper Penitencia Creek, Arroyo Aguague, Los Gatos Creek, Alamitos Creek, Arroyo Calero, Los Trancos Creek, Guadalupe Creek, the Guadalupe River, Stevens Creek, and San Francisquito Creek. Likely present in all accessible reaches of these streams in the Project Area during migration. Also present in the lower, tidal reaches of Alviso Slough, Coyote Slough, Stevens Creek, and San Francisquito Creek and in estuarine habitats of the South Bay during migration.

Table 3.3-~~21~~22. Special-Status Animal Species, Their Status, Habitat Description, and Potential for Occurrence in the Project Area

Name	Status	Habitat	Potential for Occurrence in the Project Area
South-Central California coast steelhead (*Oncorhynchus mykiss*)	FT	Cool streams with suitable spawning habitat and conditions allowing migration between spawning and marine habitats.	**Present.** Known to occur in the Project Area in the Pajaro River and its tributaries, including Llagas Creek, Uvas/Carnadero Creek, Little Arthur Creek, Bodfish Creek, Tar Creek, and Pacheco Creek. Likely present in all accessible reaches of these streams in the Project Area during migration.
California tiger salamander (*Ambystoma californiense*)	FT, SE/ CSSC	Vernal or temporary pools in annual grasslands or open woodlands.	**Present.** Historically may have occurred throughout the Project Area; however, several populations located along the valley floor have been extirpated because of habitat loss, and the species is absent from most of the valley floor. Recent occurrences are scattered throughout the Project Area on both sides of the Santa Clara Valley.
California red-legged frog (*Rana draytonii*)	FT, CSSC	Streams, freshwater pools, and ponds with emergent or overhanging vegetation.	**Present.** This species has apparently been extirpated from much of the valley floor, as well as the brackish marshes bordering the South Bay, and red-legged frogs are not expected to occur throughout most of the developed portions of the Project Area, even in streams and ponds. However, red-legged frogs are known or expected to occur in a number of locations at the periphery of the Project Area (i.e., in or near the upper, less developed reaches of streams in the Project Area).
San Francisco garter snake (*Thamnophis sirtalis tetrataenia*)	FE, SE	Freshwater marshes, ponds, and slow-moving streams along the coast.	**Absent.** Garter snakes in the northwestern part of the Project Area (*i.e.*, in the Palo Alto/Stanford area) fall within the intergrade zone between the San Francisco garter snake and the red-sided garter snake (*Thamnophis sirtalis infernalis*) (Barry 1994). The intergrade populations do not belong exclusively to either subspecies; thus, true San Francisco garter snakes do not occur in the Project Area.
Bank swallow (*Riparia riparia*)	ST (nesting)	Colonial nester on vertical banks or cliffs with fine-textured soils near water.	**Absent as Breeder.** No recent breeding records from Santa Clara County. Occurs only as a rare migrant.

Table 3.3-~~21~~22. Special-Status Animal Species, Their Status, Habitat Description, and Potential for Occurrence in the Project Area

Name	Status	Habitat	Potential for Occurrence in the Project Area
California condor (*Gymnogyps californianus*)	FE, SE	Nests in caves in steep, isolated cliffs or cavities in mature redwood trees. Forages over grasslands, open woodlands, and along coastal beaches.	**May be Present.** Historically present as a non-breeder but not currently known to occur in the Project Area. No breeding habitat for this species is present in the Project Area. Reintroduced individuals from Pinnacles National Monument in San Benito County occasionally range as far north as the Project Area (and may do so increasingly in the future if the reintroduced population expands), as five were at the summit of Mt. Hamilton in June 2011. However, such individuals are unlikely to occur in the low-elevation areas where SMP Update activities are expected to occur.
Bald eagle (*Haliaeetus leucocephalus*)	SE, SP	Occurs mainly along seacoasts, rivers, and lakes; nests in tall trees or in cliffs, occasionally on electrical towers. Feeds mostly on fish.	**Present.** Has been recorded nesting in the Project Area (i.e., below 1,000 feet elevation) at Coyote Reservoir, where a pair nested in 2010; at Anderson Reservoir, where a nesting pair was present in 2010 and possibly in several prior years; and at San Felipe Lake, where a pair is currently nesting in 2011. However, no Proposed Project activities are projected near any of these nests. Elsewhere in Santa Clara County, it has nested only at Calaveras Reservoir, which is outside the Project Area. Small numbers forage in the Project Area at all large reservoirs, and in Coyote Valley, primarily during the non-breeding season.
Swainson's hawk (*Buteo swainsoni*)	ST (nesting)	Nests in trees surrounded by extensive marshland or agricultural foraging habitat.	**Absent as Breeder.** Apparently nested in small numbers in Santa Clara County historically, and there is an 1894 nest record from the Berryessa area (currently in eastern San Jose) (Bousman 2007g). Currently the species is known to occur in the Project Area only as a very infrequent transient during migration. Although young not long out of the nest have been recorded on several occasions in the Santa Clara Valley in recent years, more concrete evidence of nesting has not been documented, so this species is currently not known to breed in the Project Area.
California clapper rail (*Rallus longirostris obsoletus*)	FE, SE, SP	Salt marsh habitat dominated by pickleweed and cordgrass.	**Present.** Suitable breeding habitat is present in the Project Area in saltmarsh habitat along the lowermost, tidal reaches of creeks that flow into San Francisco Bay (Liu et al. 2009). On very rare occasions, non-breeding individuals wander up tidal sloughs (*e.g.*, in tidal brackish/freshwater marsh habitats along Alviso Slough); however, all suitable breeding habitat for clapper rails is present in saline and brackish tidal marshes.

Table 3.3-~~21~~22. Special-Status Animal Species, Their Status, Habitat Description, and Potential for Occurrence in the Project Area

Name	Status	Habitat	Potential for Occurrence in the Project Area
California black rail (*Laterallus jamaicensis coturniculus*)	ST, SP	Breeds in fresh, brackish, and tidal salt marsh.	**May be Present.** Not known to breed in the South Bay; occurs only as a very infrequent winter visitor to tidal salt marshes along the edge of the Bay.
Western snowy plover (*Charadrius alexandrinus nivosus*)	FT, CSSC	Sandy beaches on marine and estuarine shores and salt pannes in San Francisco Bay saline managed ponds.	**Present.** Nests on levees, islands, and salt flats in some of the South Bay saline managed ponds in the Mountain View/Sunnyvale/Alviso area, and in New Chicago Marsh in Alviso. Forges in these same areas and on levees and managed pond bottoms in other ponds along the Bay edge.
California least tern (*Sterna antillarum browni*)	FE, SE, SP	Nests along the coast on bare or sparsely vegetated, flat substrates. In the South Bay, nests in salt pannes and on an old airport runway. Forages for fish in open waters.	**Present.** Does not breed in the Project Area. The South Bay is an important post-breeding staging area for least terns. Most such staging has occurred in managed ponds along the Bay in the Mountain View/Sunnyvale area (occasionally in the Alviso area).
Least Bell's vireo (*Vireo bellii pusillus*)	FE, SE	Nests in heterogeneous riparian habitat, often dominated by cottonwoods and willows.	**May be Present.** The only breeding records in Santa Clara County are from Llagas Creek southeast of Gilroy in 1997 and the Pajaro River south of Gilroy in 1932. Otherwise, records in the County include 1–2 singing males along lower Llagas Creek in May 2001, and a singing male in June 2006 along Coyote Creek near the Coyote Creek Golf Club. Although this species may increase in number and distribution as core populations increase, it is unlikely to be more than a rare and very locally occurring breeder along South County streams.
Salt marsh harvest mouse (*Reithrodontomys raviventris*)	FE, SE, SP	Salt marsh habitat dominated by common pickleweed.	**Present.** Known to occur in the Project Area in saline and brackish marshes, particularly those dominated by pickleweed or dense mature tri-corner bulrush (*Schoenoplectus americanus*) habitat around the Bay edge, including both fully tidal and diked/muted tidal marshes (H.T. Harvey & Associates 2010a).

Table 3.3-~~21~~22. Special-Status Animal Species, Their Status, Habitat Description, and Potential for Occurrence in the Project Area

Name	Status	Habitat	Potential for Occurrence in the Project Area
San Joaquin kit fox (*Vulpes macrotis mutica*)	FE, ST	Flat or gently sloping grasslands, mostly on the margins of the San Joaquin Valley and adjacent valleys.	**May be Present.** Expected to occur only in the southeastern portion of the Project Area, in the vicinity of Pacheco Creek and the uppermost reaches of the Pajaro River. If it occurs here at all, likely to occur in low numbers, and infrequently, during dispersal between areas of known breeding activity outside the Project Area. No Proposed Project activities are projected in areas where the kit fox could occur.
California Species of Special Concern			
Central Valley fall-run Chinook salmon (*Oncorhynchus tshawytscha*)	CSSC	Cool rivers and large streams that reach the ocean and that have shallow, partly shaded pools, riffles, and runs.	**Present.** Known to occur in the Project Area in Coyote Creek, Los Gatos Creek, and the Guadalupe River in very small numbers (Leidy et al. 2003). Uses the lower reaches of Coyote Creek and Alviso Slough as migration corridors between estuarine habitats and upstream spawning and rearing habitats. However, genetic analysis has confirmed that Chinook in South Bay streams are all derived from hatchery stock, and conditions for successful spawning in the Project Area are marginal.
Monterey roach (*Lavinia symmetricus subditus*)	CSSC	Fairly warm streams and rivers flowing into Monterey Bay.	**Present.** Restricted to the tributaries of the Monterey Bay. It is considered plentiful in the Pajaro watershed and is known to occur in Llagas Creek, Uvas Creek, and the Pajaro River.
Foothill yellow-legged frog (*Rana boylii*)	CSSC	Partially shaded shallow streams and riffles with a rocky substrate. Occurs in a variety of habitats in coast ranges.	**Present.** This species has disappeared from the farmed and urbanized areas of the County as well as many of the perennial streams below major reservoirs. Foothill yellow-legged frogs may still be present along the eastern and western margins of the Project Area, along the upper reaches of cobbly streams (H. T. Harvey & Associates 1999b).
Western pond turtle (*Actinemys marmorata*)	CSSC	Permanent or nearly permanent water in a variety of habitats.	**Present.** Occurs in a number of aquatic habitats in the Project Area, including a number of creeks, rivers, lakes, and ponds (H. T. Harvey & Associates 1999a, CNDDB 2011). The majority of recent occurrences in the Project Area have been from southern areas or from the margins of the Project Area, as breeding populations have been extirpated from most agricultural and urbanized areas. However, individuals of this long-lived species still occur in urban streams and ponds as well.

Table 3.3-~~21~~22. Special-Status Animal Species, Their Status, Habitat Description, and Potential for Occurrence in the Project Area

Name	Status	Habitat	Potential for Occurrence in the Project Area
California horned lizard (*Phrynosoma coronatum frontale*)	CSSC	Open habitats with sandy, loosely textured soils, such as chaparral, coastal scrub, annual grassland, and clearings in riparian woodlands with the presence of native harvester ants (*Pogonomyrmex barbatus*).	**Present.** Recorded recently in the Project Area only near Calero Reservoir. Probably restricted to a few locations at the margins of the Project Area.
Silvery legless lizard (*Anniella pulchra pulchra*)	CSSC	Areas with sandy or loose loamy soils under the sparse vegetation of beaches, chaparral, or pine-oak woodland; or sycamores, cottonwoods, or oaks that grow on stream terraces.	**Absent.** Historically recorded in Project Area in the Alviso area, but no recent records. Silvery legless lizards have been displaced by development or disturbed by agriculture in much of the Project Area, and a suite of other factors (e.g., off-road vehicle activity, erosion, livestock grazing, and the introduction of exotic plant species) has altered remaining habitat to the extent that the species is unlikely to occur in the Project Area.
Redhead (*Aythya americana*)	CSSC (nesting)	Nests in marshes and at pond margins.	**Absent as Breeder.** Recorded nesting in the Project Area only on a few occasions, in the 1970s and 1980s, at the Palo Alto Flood Control Basin. Low probability of nesting elsewhere.
Western least bittern (*Ixobrychus exilis hesperis*)	CSSC (nesting)	Nests and forages in freshwater marshes.	**Absent as Breeder.** Although the species has been recorded occasionally in the Project Area, there are no breeding confirmations from the Project Area, and this species likely occurs only as an occasional migrant.
Black skimmer (*Rynchops niger)*	CSSC (nesting)	Nests on abandoned levees and islands in saline managed ponds and marshes.	**Present.** Uncommon resident. Black skimmers have nested in the South Bay since 1994. Near the Project Area, the species has nested on islands in saline managed ponds in the Alviso area (*e.g.*, on ponds AB1, AB2, A1, A2W, A7, A8 and A16, and Pond A12 (Bousman 2007f). May forage in tidal sloughs, but not expected to occur away from tidal/bayland areas.

Table 3.3-~~21~~22. Special-Status Animal Species, Their Status, Habitat Description, and Potential for Occurrence in the Project Area

Name	Status	Habitat	Potential for Occurrence in the Project Area
Northern harrier (*Circus cyaneus*)	CSSC (nesting)	Nests in marshes and moist fields, forages over open areas.	**Present.** Within the Project Area, potential nesting habitat is present primarily in tidal marshes along sloughs, in diked/muted tidal salt marshes near the Bay, in fallow fields and pastures in Coyote Valley, and in fallow fields and wetlands along lower Llagas Creek, Carnadero Creek, and the Pajaro River. The accessibility of these areas to predators, particularly away from Bay marshes, limits the abundance of nesting pairs in the Project Area. Non-breeders are known to forage regularly in grassland, agricultural, and wetland habitats in the Project Area, occasionally (e.g., during vole outbreaks) in high densities.
Long-eared owl (*Asio otus*)	CSSC (nesting)	Riparian bottomlands with tall, dense willows and cottonwood stands (also dense live oak and California Bay along upland streams); forages primarily in adjacent open areas.	**May be Present.** Rare resident and occasional winter visitor in Santa Clara County (Bousman 2007d). Historical breeding records are known from the Santa Clara Valley floor and one recent nest was recorded at Ed Levin County Park west of Calaveras Reservoir (Noble 2007). Could potentially breed in oak woodlands, riparian habitats, and other wooded habitats in the Project Area, though likely only in very low numbers.
Short-eared owl (*Asio flammeus*)	CSSC (nesting)	Nests in marshes and moist fields, forages over open areas.	**May be Present.** Has been recorded nesting in the Project Area only in the Palo Alto Flood Control Basin, though it has not been confirmed nesting there since the 1970s. Low probability of nesting elsewhere.
Burrowing owl (*Athene cunicularia*)	CSSC	Open grasslands and ruderal habitats with suitable burrows, usually those made by California ground squirrels.	**Present.** Present year-round in the Project Area in open, agricultural, and grassland areas where active ground squirrel burrows are present. However, the species has undergone a recent decline in Santa Clara County. Core populations of breeding and overwintering burrowing owls occur at the San Jose International Airport, in the North San Jose/Alviso area, and in the northern Mountain View area.

Table 3.3-~~21~~22. Special-Status Animal Species, Their Status, Habitat Description, and Potential for Occurrence in the Project Area

Name	Status	Habitat	Potential for Occurrence in the Project Area
Vaux's swift (*Chaetura vauxi*)	CSSC (nesting)	Nests in snags in coastal coniferous forests or, occasionally, in chimneys; forages aerially.	**May be Present.** In the South Bay, breeds primarily in snags within Santa Cruz Mountain forests outside of the Project Area. However, it also breeds in residential chimneys in the foothills of the Santa Cruz Mountains. Swifts have been observed foraging widely over various habitats, but most commonly in suburban areas having chimneys suitable for nesting, such as Los Gatos, Los Altos, Los Altos Hills, Cupertino, and Campbell (Rottenborn 2007e). Thus, it likely breeds more commonly than currently recorded (though still in small numbers) in residential areas in the northwestern part of the Project Area. Forages aerially over these areas during the breeding season, and anywhere over the larger Project Area during migration.
Olive-sided flycatcher (*Contopus cooperi*)	CSSC (nesting)	Breeds in mature forests with open canopies, along forest edges in more densely vegetated areas, in recently burned forest habitats, and in selectively harvested landscapes.	**Present.** Common summer resident in western Santa Clara County (Bousman 2007c). This species breeds widely in the Santa Cruz Mountains, and more sparingly in the Diablo Range, but it does not breed on the Santa Clara Valley floor. Likely, few pairs nest at sites below 1,000 feet in elevation, but confirmed breeding has occurred at elevations as low as 400 feet (Bousman 2007c).
Loggerhead shrike (*Lanius ludovicianus*)	CSSC (nesting)	Nests in tall shrubs and dense trees; forages in grasslands, marshes, and ruderal habitats.	**Present.** Breeds in a number of locations in the Project Area where open grassland, ruderal, or agricultural habitat with scattered brush, chaparral, or trees provides perches and nesting sites (Bousman 2007k), though populations seem to have declined in recent years as suitable habitat has been increasingly developed. Occurs slightly more widely (i.e., in smaller patches of open areas providing foraging habitat) during the non-breeding season.
Yellow warbler (*Dendroica petechia*)	CSSC (nesting)	Nests in riparian woodlands.	**Present.** Uncommon breeder in wooded riparian habitats in the Project Area. Prefers riparian corridors with an overstory of mature cottonwoods and sycamores, a midstory of box elder and willow, and a substantial shrub understory (Bousman 2007j), particularly in areas with more open space adjacent to the riparian habitat (rather than in heavily developed areas). An abundant migrant throughout the Project Area during the spring and fall.

Table 3.3-~~21~~22. Special-Status Animal Species, Their Status, Habitat Description, and Potential for Occurrence in the Project Area

Name	Status	Habitat	Potential for Occurrence in the Project Area
San Francisco common yellowthroat (*Geothlypis trichas sinuosa*)	CSSC	Nests in herbaceous vegetation, usually in wetlands or moist floodplains.	**Present.** In the Project Area, the greatest proportion of breeding records are from brackish and freshwater marshes near the edge of the Bay, and in early-successional riparian habitat in broader floodplains along lower Coyote Creek and the Guadalupe River (Bousman 2007m). Nests are typically located in extensive stands of bulrushes in brackish marshes and dense cattail beds in freshwater marsh habitat, but also nests in forbs in riparian habitats. Yellowthroats nesting from the northern San Jose/Milpitas/Santa Clara/Los Gatos area northward, both along the edge of the Bay and in riparian and wetland habitats inland, are likely of this subspecies, whereas those in areas to the south are likely of the more widespread subspecies *arizela*.
Yellow-breasted chat (*Icteria virens*)	CSSC (nesting)	Nests in dense stands of willow and other riparian habitat.	**Present.** Rare breeder, and only slightly more regular transient, in willow-dominated riparian habitats in the Project Area. Historically, it likely bred more widely in Santa Clara County, but it is now rare because of the loss of suitable breeding habitat and brood parasitism by brown-headed cowbirds. In the Project Area, the species is most numerous and occurs most regularly on lower Llagas Creek, but it has been recently recorded along Coyote Creek from the vicinity of Hellyer Park upstream, and it likely occurs in low numbers on other streams south of the more urbanized San Jose area.
Alameda song sparrow (*Melospiza melodia pusillula*)	CSSC	Nests in salt marsh, primarily in marsh gumplant and cordgrass along channels.	**Present.** Endemic to Central and South San Francisco Bay. In the Project Area, it occurs in the taller vegetation found along tidal sloughs, including salt marsh cordgrass and marsh gumplant, near the South Bay. The location of the interface between populations of the Alameda song sparrow and those of the race breeding in freshwater riparian habitats (*gouldii*) along most creeks is not known because of difficulties in distinguishing individuals of these two races in the field.

Table 3.3-~~21~~22. Special-Status Animal Species, Their Status, Habitat Description, and Potential for Occurrence in the Project Area

Name	Status	Habitat	Potential for Occurrence in the Project Area
Grasshopper sparrow (*Ammodramus savannarum*)	CSSC (nesting)	Breeds and forages in grasslands, meadows, fallow fields, and pastures.	**Present.** Nests in extensive grasslands with some heterogeneity, including serpentine grasslands. In the Project Area, breeding birds occur in the foothills of the Santa Cruz Mountains, and from Calaveras Reservoir southeast to the hills above Pacheco Creek (Heller 2007). Breeding birds also occur in the southeast portion of the Project Area where the hills drop down to the Pajaro River Valley (Heller 2007). It may occur somewhat more widely during migration, but it is seldom detected in the Project Area outside the breeding season.
Bryant's savannah sparrow (*Passerculus sandwichensis alaudinus*)	CSSC	Nests in pickleweed dominated salt marsh and adjacent ruderal habitat.	**Present.** Breeds in the Project Area primarily in short pickleweed-dominated portions of diked/muted tidal salt marsh habitat, and in adjacent ruderal habitat, in the South San Francisco Bay area (Rottenborn 2007b). Breeding has also been confirmed in expanses of short grassland in inland/non-instream areas on the west side of the Coyote Valley and in the Santa Cruz Mountain foothills just north of the Pajaro River Valley (Rottenborn 2007b). During the non-breeding season, *alaudinus* and other savannah sparrow subspecies may forage in open areas throughout the Project Area.
Tricolored blackbird (*Agelaius tricolor*)	CSSC (nesting colony)	Nests near fresh water in dense emergent vegetation.	**Present.** Typically nests in extensive stands of tall emergent herbaceous vegetation in freshwater marshes and ponds. In the Project Area, the species is patchily distributed in the Santa Clara Valley, its distribution reflecting the patchy nature of its breeding habitat (Rottenborn 2007a). Occurs as an uncommon non-breeding forager throughout most of the Project Area.
Salt marsh wandering shrew (*Sorex vagrans halicoetes*)	CSSC	Medium-high marsh 6-8 ft above sea level with abundant driftwood and common pickleweed.	**May be Present.** Formerly more widely distributed in the Bay Area, this small insectivorous mammal is now confined to salt marshes of the South Bay (Findley 1955). Salt marsh wandering shrews occur most often in medium-high wet tidal marsh (6 to 8 feet above sea level), with abundant driftwood and other debris for cover (Shellhammer 2000). They have also been recorded occasionally in diked marsh. This species is typically found in fairly tall pickleweed, in which these shrews build nests.

Table 3.3-~~21~~22. Special-Status Animal Species, Their Status, Habitat Description, and Potential for Occurrence in the Project Area

Name	Status	Habitat	Potential for Occurrence in the Project Area
Pallid bat (*Antrozous pallidus*)	CSSC	Forages over many habitats; roosts in caves, rock outcrops, buildings, and hollow trees.	**Present.** Historically, likely present in a number of locations throughout the Project Area, but this species has declined in recent decades. Known maternity colonies in the Project Area occur at several locations, such as on Cochrane Road near Anderson Dam; south of Berryessa Creek and close to Old Piedmont Road, and on Chaboya Court at the end of Quimby Road in eastern San Jose; and on the Highway 152 bridge over Uvas Creek. Suitable roosting sites are present in a number of other areas, particularly in or near open space or less developed areas around the periphery of the Project Area, and the species may be more widespread than is known. Individuals could potentially forage in the Project Area in open areas located within several miles of colonies.
Townsend's big-eared bat (*Corynorhinus townsendii*)	CSSC	Roosts in caves and mine tunnels, and occasionally in deep crevices in trees such as redwoods or in abandoned buildings, in a variety of habitats.	**May be Present.** No known extant populations on the Santa Clara Valley floor, and no breeding sites known from the Project Area. Occasionally individual Townsend's big-eared bats may roost and forage in habitats nearly anywhere in the Project Area, but such individuals are expected to occur very infrequently and in small numbers. Roosting colonies are known from UTC Property east of Coyote Ridge near Metcalf Road and at Almaden-Quicksilver County Park. Although both locations are outside the Project Area, these records indicate the potential for this species to occur in suitable habitat in the Project Area, possibly near southern Coyote Ridge and northern Anderson Reservoir or in the Guadalupe Mines area.
Western red bat (*Lasiurus blossevillii*)	CSSC	Roosts in foliage in forest or woodlands, especially in or near riparian habitat.	**Present.** Occurs as a migrant and winter resident, but does not breed in the Project Area. May roost in foliage in trees virtually anywhere in the Project Area, but expected to roost primarily in riparian areas.
San Francisco dusky-footed woodrat (*Neotoma fuscipes annectens*)	CSSC	Nests in a variety of habitats including riparian areas, oak woodlands, and scrub.	**Present.** Currently, with the exception of records along Coyote Creek and along the edges of the valley, San Francisco dusky-footed woodrats are not known to occur on the urban Santa Clara Valley floor (H. T. Harvey & Associates 2010c. They have also likely been extirpated in the southern portion of the County in the Gilroy and Morgan Hill areas where the valley floor is developed (H. T. Harvey & Associates 2010c). In the Project Area, Coyote Creek likely supports extant populations of the San Francisco dusky-footed woodrat. Where low open valleys are less developed, woodrat populations appear to remain intact.

Table 3.3-~~21~~22. Special-Status Animal Species, Their Status, Habitat Description, and Potential for Occurrence in the Project Area

Name	Status	Habitat	Potential for Occurrence in the Project Area
American badger (*Taxidea taxus*)	CSSC	Burrows in grasslands and occasionally in infrequently disked agricultural areas.	**Present.** Known to occur in the Project Area primarily in grasslands and less frequently disturbed agricultural habitats, mostly in the foothills but sometimes on the valley floor.
State Fully Protected Species			
American peregrine falcon (*Falco peregrinus anatum*)	SP	Forages in many habitats; nests on cliffs and tall bridges and buildings.	**Present.** Peregrine falcons are uncommon breeders in the Project Area, but non-breeders are present in small numbers in fall and winter. They may occur anywhere throughout the Project Area as a forager or migrant, though always at low densities. In the Project Area, peregrine falcons are known to nest at San Jose City Hall and on electrical towers in Mountain View and Alviso managed ponds. Might breed more widely in the Project Area from 2012–2022.
Golden eagle (*Aquila chrysaetos*)	SP	Breeds on cliffs or in large trees (rarely on electrical towers), forages in open areas.	**Present.** Breeds widely in the Diablo Range and less commonly in the Santa Cruz Mountains, mostly above the elevation of the Project Area, but a few pairs breed at the edges of the Santa Clara Valley at elevations within the Project Area (Bousman 2007l). Forages somewhat more widely in agricultural/open space areas on the valley floor, such as in the Alviso area, in Coyote Valley, and in the Pajaro River watershed.
White-tailed kite (*Elanus leucurus*)	SP	Nests in tall shrubs and trees, forages in grasslands, marshes, and ruderal habitats.	**Present.** Breeds across the northern edge of Santa Clara County from the foothills of the Santa Cruz Mountains near Palo Alto, through the open areas edging the South Bay, and into the foothills of the Diablo Range east of Milpitas (Mammoser 2007). Also occurs at scattered locations southward along the Santa Clara Valley floor and the foothills on either side of the valley. Also fairly common along Llagas and Uvas/Carnadero creeks and the Pajaro River.
Ringtail (*Bassariscus astutus*)	SP	Cavities in rock outcrops and talus slopes, as well as hollows in trees, logs, and snags that occur in riparian habitats and dense woodlands, usually in close proximity to water.	**May be Present.** Ostensibly, suitable habitat is present in forested areas at the upper margins of the Project Area, but there are few confirmed records. The species has been observed near Lexington Reservoir, near Highway 152 just west of Gilroy, and near the confluence of Carnadero Creek and the Pajaro River, and it may be present in other areas removed from urbanization.

Table 3.3-~~21~~22. Special-Status Animal Species, Their Status, Habitat Description, and Potential for Occurrence in the Project Area

Name	Status	Habitat	Potential for Occurrence in the Project Area
Other Special-Status Species			
Mimic tryonia (*Tryonia imitator*)		Coastal lagoons, estuaries, and salt marshes with permanent water.	**Present.** The CNDDB has two records of this species in Santa Clara County, both within the Project Area in the Alviso area (CNDDB 2011).
Hom's micro-blind harvestman (*Microcina homi*)		Endemic to serpentine soils in California. Found under moist rocks in open hillside-grassland habitat.	**May be Present.** Has been observed or collected at eight sites, all within Santa Clara County (USFWS 1998b). In the Project Area, it has been observed in the Santa Teresa Hills, the Morgan Hill area, north of U.S. Highway 101 on Metcalf Road, and near Silver Creek Road (CNDDB 2011).
Jung's micro-blind harvestman (*Microcina jungi*)		Endemic to serpentine soils in California.	**May be Present.** Known only from one rocky serpentine grassland location 0.9 mile south of the junction of Silver Creek and San Felipe roads near San Jose (USFWS 1998b, CNDDB 2011).
Opler's longhorn moth (*Adela oplerella*)		Serpentine-derived or similar soils that support the moth's host plant, California cream cups.	**May be Present.** Known from nine serpentine habitat locations in Santa Clara County, all within the Project Area (USFWS 1998b). Occurs on both sides of U.S. Highway 101 from Upper Hellyer Canyon to just south of Gilroy.
Unsilvered fritillary (*Speyeria adiaste adiaste*)		Openings in conifer and redwood forests, as well as oak woodlands, chaparral, and grassy slopes in the central coast region of California. Require violets (*Viola* spp.) as larval host plants.	**Absent.** This subspecies is known from the Santa Cruz Mountains in San Mateo, Santa Cruz, and Santa Clara counties. It is not expected to occur at elevations below 1,000 feet in Santa Clara County. Determined to be absent from the Project Area.

Table 3.3-~~21~~22. Special-Status Animal Species, Their Status, Habitat Description, and Potential for Occurrence in the Project Area

Name	Status	Habitat	Potential for Occurrence in the Project Area
Pacific lamprey (*Lampetra tridentata*)		Spawns in gravel-bottomed streams or rivers upstream of riffle habitat. Adults forage in marine areas.	**Present.** Historically, this species may have been present in streams throughout the Project Area. Currently known from the Guadalupe River San Francisquito, Coyote, Upper Penitencia, Lower Silver, Guadalupe, Alamitos, Stevens, and Uvas Creeks, and may be locally common in these areas (Leidy 2007, SCVWD fish sampling and relocation data 2002–2009). Species' status is poorly documented, and abundance in other streams throughout the Project Area is poorly understood. May be present in all accessible portions of streams in the Project Area during migration between spawning areas and marine foraging habitat.
Pacific harbor seal (*Phoca vitulina richardii*)	MMPA	Throughout the northern Atlantic and Pacific Oceans along coastal waters, river mouths, and bays	**May be Present.** Permanent resident of San Francisco Bay. Primary haul-out sites in San Francisco Bay include Mowry Slough (243 seals in 1999), northeast of the Project Area. Suitable haul-out sites for harbor seals are present in the Project Area in the tidal reaches of sloughs in the South Bay area and use of haul-out sites varies over time. No pupping sites are currently known within the Project Area, though potentially suitable pupping habitat is present.

Key to Abbreviations:
Status: Federally Endangered (FE); Federally Threatened (FT); State Endangered (SE); State Threatened (ST); State Candidate for Listing (SC); State Protected (SP); California Species of Special Concern (CSSC); Species Protected by the Marine Mammal Protection Act (MMPA).

Source: Data compiled by Horizon Water and Environment in 2011

Chapter 3.4

CULTURAL RESOURCES

3.4 Cultural Resources

3.4.1 Introduction

This section presents the regulatory setting, environmental setting, and potential impacts of the Proposed Project related to cultural resources.

Cultural resources are the remains and sites associated with past human activities and include prehistoric and ethnographic Native American archaeological sites, historic archaeological sites, historic buildings, and elements or areas of the natural landscape which have traditional cultural significance. A paleontological resource is defined as fossilized remains of vertebrate and invertebrate organisms, fossilized tracks, and plant fossils.

Study Area

The study area for the cultural resources evaluation is a 1-mile radius from Proposed Project channels, canals, access roads, and other features under the maintenance authority of the SCVWD under the current SMP. The study area was used to help determine general areas of sensitivity which are discussed in Section 3.4.3, *Environmental Setting*.

Area of Potential Effects

The Area of Potential Effects (APE) includes channels, canals, access roads, and other features maintained by the SCVWD under the current SMP. A 100-foot buffer from the top of bank was included in the APE to account for access and staging areas. The purpose of the APE was to determine site sensitivity in relation to specific watercourses and facilities under the Proposed Project. If present, a large number of previously-identified cultural resources located within the APE would indicate an elevated level of sensitivity, suggesting increased likelihood that Proposed Project activities could cause adverse impacts to historic properties.

3.4.2 Regulatory Setting

Federal Plans, Policies, Regulations, and Laws

National Historic Preservation Act/Section 106
The National Historic Preservation Act (NHPA) of 1966, as amended, requires federal agencies to consider the preservation of historic and prehistoric resources. The NHPA authorizes the Secretary of the Interior to expand and maintain a National Record of Historic Places (NRHP), and it has established an Advisory Council on Historic Preservation (ACHP) as an independent federal entity. Section 106 of the Act requires federal agencies to take into account the effects of their undertakings on historic properties and afford the ACHP a reasonable opportunity to comment on the undertaking before licensing or approving the expenditure of funds on any undertaking that may affect properties listed, or eligible for listing, in the NRHP.

Federal review of projects is normally referred to as the Section 106 process. The Section 106 review normally involves a four-step procedure described in detail in the implementing regulations (36 CFR Part 800):

- identify and evaluate historic properties in consultation with the State Historic Preservation Officer (SHPO) and interested parties;
- assess the effects of the undertaking on properties that are eligible for inclusion in the NRHP;
- consult with the SHPO, other agencies, and interested parties to develop an agreement that addresses the treatment of historic properties and notify the ACHP; and
- proceed with the project according to the conditions of the agreement.

National Environmental Policy Act

The National Environmental Policy Act of 1969 requires federal agencies to foster environmental quality and preservation. Section 101(b)(4) declares that one objective of the national environmental policy is to "preserve important historic, cultural, and natural aspects of our national heritage... ." For any major federal actions significantly affecting environmental quality, federal agencies must prepare, and make available for public comment, an Environmental Impact Statement.

Advisory Council on Historic Preservation Regulations, Protection of Historic Properties

The Advisory Council Regulations, Protection of Historic Properties (36 CFR 800) establish procedures for compliance with Section 106 of the NHPA of 1966. These regulations define the Criteria of Adverse Effect, define the role of the SHPO in the Section 106 review process, set forth documentation requirements, and describe procedures to be followed if significant historic properties are discovered during implementation of an undertaking. Prehistoric and historic resources deemed significant (i.e., eligible for listing in the NRHP, per 36 CFR 60.4) must be considered in project planning and construction. The responsible federal agency must submit any proposed undertaking that may affect NRHP-eligible properties to the SHPO for review and comment before the project's approval.

National Park Service Regulations, National Register of Historic Places

The National Park Service Regulations' NRHP (36 CFR 60) set forth procedures for nominating properties to the NRHP and present the criteria to be applied in evaluating the eligibility of historic and prehistoric resources for listing in the NRHP.

Archaeology and Historic Preservation: Secretary of the Interior's Standards and Guidelines

Archaeology and Historic Preservation; Secretary of the Interior's Standards and Guidelines (FR 190:44716–44742) offer non-regulatory technical advice about the identification, evaluation, documentation, study, and other treatment of cultural resources. Notable in these guidelines are the "Standards for Archaeological Documentation" (p. 44734) and "Professional Qualifications Standards for Archaeology" (pp. 44740–44741).

Section 106 of the NHPA prescribes (at 36 CFR Section 800.5) specific criteria for determining whether a project would have an adverse effect on a historic property, if any such properties exist in the APE as defined by the agency. An impact is considered adverse when prehistoric or historic archaeological sites, structures, districts, or objects listed in or eligible for listing in the NRHP are subjected to the following effects:

- physical destruction of or damage to all or part of the property;
- alteration of a property;
- removal of the property from its historic location;
- change of the character of the property's use or of physical features within the property's setting that contribute to its historic significance;
- introduction of visual, atmospheric, or audible elements that diminish the integrity of the property's significant historic features;
- neglect of a property that causes its deterioration; and
- transfer, lease, or sale of the property.

Because SCVWD would need to obtain a permit from USACE under Section 404 of the Clean Water Act, the Proposed Project constitutes a federal undertaking that would require compliance with Section 106 of the NHPA, and federal significance criteria apply. For federally permitted or funded projects, cultural resource significance is evaluated in terms of eligibility for listing in the NRHP. NRHP criteria for eligibility are defined as follows:

> The quality of significance in American history, architecture, archeology, and culture is present in districts, sites, buildings, structures, and objects of state and local importance that possess integrity of location, design, setting, materials, workmanship, feeling and association, and that:
>
> - are associated with events that have made a contribution to the broad pattern of our history;
> - are associated with the lives of people significant in our past;
> - embody the distinct characteristics of a type, period, or method of construction, that represent the work of a master, that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
> - have yielded, or are likely to yield, information important in prehistory or history.

American Indian Religious Freedom Act

The American Indian Religious Freedom Act of 1978 allows access to sites of religious importance to Native Americans.

State Plans, Policies, Regulations, and Laws

California implements the NHPA through its statewide comprehensive cultural resource surveys and preservation programs. The California Office of Historic Preservation (OHP), an office of the California Department of Parks and Recreation, implements the policies of the NHPA on a statewide level. The OHP also maintains the California Historic Resources Inventory. The SHPO is an appointed official who implements historic preservation programs within the state's jurisdictions as well as serving as a consulting party in the federal process described above.

California Register of Historic Resources

The California Register of Historic Resources (CRHR) is "an authoritative listing and guide to be used by state and local agencies, private groups, and citizens in identifying the existing historical resources of the state and to indicate which resources deserve to be protected, to the extent prudent and feasible, from substantial adverse change" (California Public Resources Code [PRC] Section 5024.1[a]). The eligibility criteria for inclusion on the CRHR are based on NRHP criteria (PRC Section 5024.1[b]). Certain resources are determined by the statute to be automatically included in the California CRHR, including California properties formally determined eligible for, or listed in, the NRHP.

To be eligible for the CRHR, a prehistoric or historical-period property must be significant at the local, state, and/or federal level under one or more of the following criteria:

- it is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;
- it is associated with the lives of persons important in our past;
- it embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values; or,
- it has yielded, or may be likely to yield, information important in prehistory or history.

For a resource to be eligible for the CRHR, it must also retain enough of its character or appearance (integrity) to be recognizable as a historical resource and to convey the reason for its significance. A historic resource that does not retain sufficient integrity to meet the NRHP criteria may still be eligible for listing in the CRHR.

The CRHR consists of resources that are listed automatically as well as those that must be nominated through an application and public hearing process. The CRHR automatically includes the following:

- California properties listed on the NRHP and those formally determined to be eligible for the NRHP;

- California Historical Landmarks from No. 770 onward; and
- California Points of Historical Interest that have been evaluated by the OHP and have been recommended to the State Historical Resources Commission for inclusion on the CRHR.

Other resources that may be nominated to the CRHR include:

- Historical resources with a significance rating of Category 3 through 5 (i.e., properties identified as eligible for listing in the NRHP, the CRHR, and/or a register maintained by a local jurisdiction);
- Individual historical resources;
- Historical resources contributing to historic districts; or
- Historical resources designated or listed as local landmarks, or designated under any local ordinance, such as a historic preservation overlay zone.

California Environmental Quality Act

CEQA, as codified at PRC Sections 21000 et seq., requires lead agencies to determine if a proposed project would have a significant effect on archaeological resources. As defined in PRC Section 21083.2, a "unique" archaeological resource is an archaeological artifact, object, or site about which it can be clearly demonstrated that, without merely adding to the current body of knowledge, there is a high probability that it meets any of the following criteria:

- Contains information needed to answer important scientific research questions and there is a demonstrable public interest in that information;
- Has a special and particular quality such as being the oldest of its type or the best available example of its type; and
- Is directly associated with a scientifically recognized important prehistoric or historic event or person.

In addition, the State CEQA Guidelines define historical resources as: (1) a resource in the CRHR; (2) a resource included in a local register of historical resources, as defined in PRC Section 5020.1(k) or identified as significant in a historical resource survey meeting the requirements of PRC Section 5024.1(g); or (3) any object, building, structure, site, area, place, record, or manuscript that a lead agency determines to be historically significant or significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California, provided the lead agency's determination is supported by substantial evidence in light of the whole record.

If a lead agency determines that an archaeological site is a historical resource, the provisions of PRC Section 21084.1 and State CEQA Guidelines Section 15064.5 would apply. If an archaeological site does not meet the State CEQA Guidelines criteria for a historical resource, then the site is to be treated in accordance with the provisions of PRC Section 21083 regarding unique archaeological resources. The State CEQA Guidelines note that if a resource is neither a unique archaeological resource nor a historical resource, the effects of

a project on that resource shall not be considered a significant effect on the environment (State CEQA Guidelines Section 15064[c][4]).

Per CEQA, the Proposed Project would be considered to have a significant impact on the environment if it would:

- Cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5;
- Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5;
- Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature; or
- Disturb any human remains, including those interred outside of formal cemeteries.

California Public Resources and Administrative Codes

Human remains, including those buried outside of formal cemeteries, are protected under several state laws, including PRC Section 5097.98 and Health and Safety Code Section 7050.5. Impacts include intentional disturbance, mutilation, or removal of interred human remains.

Regional and Local Plans, Policies, Regulations, and Ordinances

Applicable regional and local plans, policies, regulations, or ordinances related to cultural resources are presented in Appendix D.

3.4.3 Environmental Setting

This environmental setting discussion is divided into three parts. The first summarizes the cultural history of the Santa Clara Valley region. Because archaeological and historic regions can encompass large geographic areas and display some cultural homogeneity throughout, a discussion of the prehistoric, ethnographic, and historic contexts is useful to evaluate the impacts to cultural resources in the APE. The second part addresses the geologic formations in the Project Area and their potential to contain paleontological resources. The third part discusses previous cultural resources surveys and assessments conducted from 2002 through 2011 in the Project Area.

Cultural History

Prehistoric Context

An analytic framework for the interpretation of South San Francisco Bay and Central Coast Ranges prehistory is provided by Milliken et al. (2007:99–123) and Hylkema (2007). Hylkema observes three broad periods of human history in South San Francisco Bay: Early Holocene (10,000 to 6650 Before Present [B.P.]), the Middle Holocene (6650 to 3350 B.P.), and the Late Holocene (3350 to present). Milliken et al. (2007) observe six temporal periods

that build from the temporal sequence originally outlined by Frederickson (1994:25–48) and synthesize subsequent dating schemes with new *Olivella* bead data:

- The Early Holocene, or Lower Archaic (9950 to 5450 B.P.)
- Early Period, or Middle Archaic (5450 to 2450 cal B.P.)
- Lower Middle Period, or Initial Upper Archaic (2450 to 1520 B.P.)
- Upper Middle Period, or Late Upper Archaic (1520 to 900 B.P.)
- Initial Late Period, or Lower Emergent (900 to 400 B.P.)
- Terminal Late Period (400 to 174 B.P.)

The post-Pleistocene era (post-10,000 B.P.) is generally characterized as a period of dramatic environmental change. Very little is known about the human history of Central California and the San Francisco Bay region before approximately 9950 B.P., but hunter-gatherers presumably inhabited the region as evidenced by Pleistocene faunal remains and other isolated finds, including fluted projectile points (Erlandson et al. 2007:161–174; Parkman 2006; Rosenthal et al. 2007:151). Warming trends in the global environment after 10,000 B.P. contributed to rising sea levels and the gradual inundation of the verdant plain—and possibly the earliest record of human occupation in the area—now submerged beneath present-day San Francisco Bay. The rising sea level eventually slowed approximately 6000 B.P. During this time, lush tidal marsh habitats formed around the margins of the Bay, creating a diverse regional ecosystem that, in turn, attracted fish species, waterfowl, sea mammals, terrestrial game, and humans.

Hylkema (2007) outlines general trends in South Bay prehistory. Early mobile forager land use gave way to semi-sedentary collector land use—and shell mound construction—near the close of the Early Holocene. Stone mortars and pestles appear in greater frequency within Middle Period archaeological deposits in the Santa Clara Valley, which suggests a milling economy with emphasis on vegetal foods, especially acorns and small seeds (Hylkema 2007:27; Moratto 1984). This contrasts with areas to the southeast of South San Francisco Bay where a greater frequency of chert projectile points and knives in the archaeological record indicate emphasis on hunting terrestrial game. The Late Period is generally considered a period of cultural and environmental florescence. At this time, growing hunter-gatherer populations in the Santa Clara Valley, southern Santa Clara Valley, and broader San Francisco Bay region contributed to intensified collection of animal and plant resources from diverse coastal, intertidal, and interior habitats. They further developed social innovations to efficiently procure animal, plant, and mineral resources, including co-harvesting subsistence strategies, storage practices, and exchange systems (Hylkema 2002:252–253; 2007:29).

Discrete temporal periods within the San Francisco Bay region are further developed by Milliken et al. (2007), who integrate accelerator mass spectrometry radiocarbon data collected from 103 well-provenienced *Olivella* beads. Within the chronological sequence outlined above, Milliken et al. (2007:105) further distinguish multiple bead horizons to refine "significant variation in time and space" in Bay Area prehistory. These bead horizons include: the Early Period/Middle Period Transition (EMT); M1, M2, M3, and M4 horizons in the Middle Period; the Middle Period/Late Period Transition; and L1 and L2 horizons in the Late Period.

Early Period archaeological deposits and hunter-gatherer sedentism are signaled by groundstone technology—typically stone mortars and pestles—and the first cut shell beads. Early millingstone technology is represented best at sites in the Santa Clara Valley, such as CA-SCL-65 and CA-SCL-178 (Hylkema 2002:233), and discrete terrace sites in the western foothills of the southern Santa Clara Valley, or San Felipe Sink (Hildebrandt and Mikkelsen 1993:191). Shell beads from this time period are often in mortuary contexts, such as the 5,900-year-old Sunnyvale Red Burial (CA-SCL-832), which contained red ocher and double-perforated Haliotis rectangle beads (Milliken et al. 2007:115). The EMT Bead Horizon marks the end of the Early Period and is indicated by split-beveled and tiny saucer *Olivella* beads. EMT funerary contexts contain few associated goods, except for some with spire-lopped *Olivella* beads. Osteological data collected from EMT/M1 sites also reveal evidence of interpersonal violence, including healed bone fractures and puncture wounds; evidence of violent death; postmortem skeletal modifications; and haphazard disposal of human skeletal remains (Milliken 2007:113). Well-documented evidence of violence is seen at the Skyport Plaza site (CA-SCL-478), where archaeologists uncovered evidence of trophy taking, mass burials, and warfare (Milliken et al. 2007:113). The Three Wolves site, CA-SCL-732, represents another Middle Period special use cemetery where archaeologists recovered the remains of 107 individuals some with evidence of traumatic injury (Cambra et al. 1996).

During the lower and upper Middle Periods (2450 to 1250 B.P.), an intensified tidal marsh economy was present and contributed to the formation of large shell mounds along the San Francisco Bay shore. This subsistence strategy persisted into the Middle Period, though use of local resources intensified. Bead Horizon M1 (2150 to 1520 B.P.) developed out of the EMT and is signaled by the common occurrence of *Olivella* saucer beads, as well as by new bone tool forms and bone ornaments such as barbless fish spears, elk femur spatulae, bone tubes, and bone whistles (Milliken et al. 2007:115). The trade of *Olivella* saucer-beads collapsed at about 1520 B.P., or the beginning of the M2 Bead Horizon in the upper Middle Period (1520 to 900 B.P.).

The South Bay during the Middle Period also played host to the spread of the Meganos culture, which possibly arrived from the Sacramento-San Joaquin River Delta area. The Meganos culture is represented archaeologically by a dorsal extended burial mortuary pattern with few grave-associated artifacts (Bennyhoff 1994:15–24), and it also is signaled by the production of *Olivella* saddle beads. Meganos would eventually spread to the Santa Clara Valley, as seen at sites like Wade Ranch (CA-SCL-302). By the emergence of Bead Horizons M2 and M3—the "climax of upper Middle Period stylistic refinement" (Milliken et al. 2007:116)—obsidian blades, fishtail charmstones, new *Haliotis* ornament forms, and mica ornaments accompany *Olivella* saucer beads in some Bay Area archaeological contexts. Bead Horizon M4 may be a period of "post-climax culture" with a variety of wide and tall *Olivella* saddle bead forms.

Olivella bead production during the initial Late Period (900 to 400 B.P.) and L1 Bead Horizon is marked by technological sophistication and accompanied by the production of finely-crafted wealth objects. New shell bead types include *Olivella* sequin and cup beads and an array of multi-perforated and bar-scored *Haliotis* ornaments, such as those appearing at Tamien Station, CA-SCL-690 (Hylkema 2007). A shift from collection of terrestrial mammals (canid, elk, and deer) to sea otter and deer is believed to represent

economic intensification from the Middle through Late Periods, in addition to the development of co-harvesting strategies, drawing increasingly from estuarine and terrestrial habitats.

In the San Felipe Sink, a highly mobile Early Period foraging system—which utilized resources from Elkhorn Slough and inland areas—transitioned during the Middle Period to greater dependence on acorn and local lacustrine resources (Hildebrandt and Mikkelsen 1993:183, 191; Hildebrandt et al. 1991:5-7). By the Late Period, hunter-gatherer use of coastal resources appears to have switched to collecting lacustrine plants and animals; a pattern that mirrors historical observations. Arrow-sized obsidian projectile points first appear in the Bay Area during this time, and include small finely-crafted Stockton serrated points (Hylkema 2002:247). However, in the South Bay debitage and most flaked stone tools continued to be produced from local Franciscan chert, potentially indicating restricted access to North Bay obsidian sources because of social prohibitions on the exchange of obsidian and other prestige items around San Francisco Bay (Jackson and Ericson 1994:385–415). High-status burials and partial cremations, often associated with grave offerings like *Haliotis* "banjo" effigy ornaments, offer additional evidence of social stratification during the initial Late Period.

During the Late Period, many Middle Period traits gave way to social and economic forms consistent with those evident during ethnographic times. Almost abruptly at 400 B.P., archaeological evidence of *Olivella* sequin and cup beads drops off in the North Bay, replaced by the production and widespread distribution of clamshell disk beads, markers of the L2 Bead Horizon. Lipped and spire-lopped *Olivella* beads continued to be produced and exchanged in the South Bay between 400 B.P. and 300 B.P. Desert side-notched points also have been recovered from some South Bay archaeological sites dating to the Late Period (Jackson 1986).

In general, the following archaeological resources could potentially be encountered during ground-disturbing activities near bodies of water within Santa Clara Valley: remnants of large shell mounds; shallow or broadly dispersed midden sites; lithic scatters; multi-component villages; and cemeteries. Over 400 shell mounds once ringed the San Francisco Bay shoreline, and several are recorded within Santa Clara County. Some mound sites reached heights of between 5 to 60 feet, and many contain multiple depositional episodes spanning several hundred to several thousands of years. Used in prehistory and in historic times, the Yñigo Mound (CA-SCL-12/H) was once part of a cluster of 13 mounds along the southern edge of San Francisco Bay and it rose approximately 5 feet. This mound—like many around the Bay Area—has been impacted by commercial development, although intact deposits are buried beneath Moffett Field Naval Air Station (Bryne and Byrd 2009:82–88).

Other midden sites are shallow (between 1 to 4 feet deep) and are sometimes dispersed over several hundred meters. As with shell mounds, middens are composed of densely packed deposits of shell, earth, rock, ash, botanical and faunal (mammal, bird, fish, shellfish, and reptile) remains, artifacts (groundstone, flaked stone, fire-affected rock, shell tools and ornaments, and modified bone), and features such as hearths, house floors, and human burials accumulated over longer or shorter periods of time. Some archaeological sites also contain evidence of residence during colonial and historic times, including glass beads,

worked glass tools, ceramics, and metal artifacts. Middens also can be found along the San Francisco Bay, where shellfish remains are more prevalent, or they also can be found inland along rivers, creeks, sloughs, and lakes. Several large and small midden sites containing artifacts and human burials are recorded throughout the Santa Clara Valley (Hildebrandt and Mikkelsen 1993; Hylkema 2007). Lithic scatters also are evidenced by sparse or densely scattered lithic debitage from the production/use of stone tools and other processing activities. For example, one site (CA-SCL-308/H) located along a seasonal creek overlooking the Pajaro River alluvial plain in southern Santa Clara Valley contains groundstone implements, flaked stone tools and debris, fire-affected rock, as well as faunal remains and modified bone (Hildebrandt and Mikkelsen 1993).

Archaeological resources in the Santa Clara Valley also include multi-component village sites. These sites generally exhibit a suite of daily and ceremonial practices as evidenced by the presence of midden soils, which contain botanical and faunal remains, bone and stone tools, living surfaces and house floors, and human burials. One village site (CA-SCL-119/CA-SBN-24/H) is located on the shore of San Felipe Lake. It was once near four major habitat zones—oak savanna, open prairie, riparian habitat, and tule marsh—and consists of five spatially discrete loci with house floors, hearths, human burials, plant and animal remains, bone and stone tools, and shell beads. Research in the southern Santa Clara Valley continues to explore the extent to which the broad Pajaro River alluvial plain was inhabited prehistorically, or not at all. As Hildebrandt et al. (1991:5–7) summarize, some believe the plain was once a year-round wetland that prevented human settlement in areas other than at the mouths of adjacent canyons. Others believe that the plain was dry for most of the year, and prehistoric residences may be found along any of the present-day sloughs and creeks that cross the plain. It is now generally believed that human occupation along riparian and lacustrine habitats intensified after approximately 450 B.P. (Hildebrandt et al. 1991:5–7).

The Late Period shift towards intensively collecting wetland resources was observed historically and is evidenced by at least one contact period cemetery (CA-SCL-714/H) north of Pajaro Gap in the Pajaro River drainage. Cemeteries also are described by Cambra et al. (1996; CA-SCL-732) and Hylkema (2007; CA-SCL-690). A formal, planned cemetery, CA-SCL-690, where approximately 124 human burials were discovered, is located 1,000 feet east of the Guadalupe River in downtown San Jose. The river and Los Gatos Creek are major contributors of sediment to the Santa Clara Valley, which increase the likelihood of encountering buried archaeological resources along water courses. At the time of European contact, Native Americans buried and cremated their dead. Grave goods—including shell beads, stone and bone implements—are associated with some burials.

Ethnographic Context/Ohlone

The Project Area is located within the ethnographic territory of the Muwekma Costanoan/Ohlone Indians. For the Costanoan/Ohlones, areas around streams were frequently settled and/or heavily used and, as described above, are generally locations of high sensitivity for archeological deposits. In general, protohistoric and colonial archaeological resources could potentially be encountered during ground-disturbing activities near bodies of water within Santa Clara Valley. This would include Native American village sites and processing areas as a continuation of settlement patterns

associated with the Late Period (see above); artifacts and features deposited by European settlers; as well as, material evidence of cultural intermingling, perhaps similar to that recovered from mission and mercantile colonies in the Bay Area (Lightfoot 2005) and from subsequent Mexican ranchos and American settlements.

The ethnographic territory of the Muwekma Costanoan/Ohlone includes all of present-day Santa Clara County, and originally included (1) the San Francisco Peninsula south to Big Sur (in Monterey County) and (2) inland from Carquinez Strait to Soledad (Levy 1978:485). In the aboriginal Tamien and Chochenyo (or Lisyan) languages spoken in Costanoan/Ohlone territory, "Muwekma" means "People" (Levy 1978). As Field et al. (2007:62) further clarify, Muwekma accurately reflects how Costanoan/Ohlones identified themselves in the Santa Clara Valley region and Ohlone is used to define Costanoan/Ohlone in their entire territory. The Costanoan language belongs to the Penutian stock (Golla 2007:71–82), and is divided between eight separate languages (not dialects): Karkin; Chochenyo (East Bay Costanoan); Tamien (Santa Clara Costanoan); Ramaytush (San Francisco Costanoan); Awaswas (Santa Cruz Costanoan); Mutsun; and Rumsen.

The primary sociopolitical unit was the village community, or tribelet. Ohlone tribelets consisted of a principal village, at which the chief resided, surrounded by several secondary settlements (Kroeber 1962:81–120). The Ohlone were further grouped into clans—with either deer or bear moieties—and each village community averaged between 100 to 2,000 people with households averaging between 10-15 persons (Levy 1978:487). Tribelet boundaries were typically defined by physiographic features, and are generally believed to provide enough habitat diversity to "buffer the vagaries of environmental perturbations during most years, but small enough to remain manageable from a few village locations that may have been moved once or twice a year" (Lightfoot and Parrish 2009:80). Chiefs may have been either men or women, and they were usually in charge of: resolving disputes; organizing events, including dances and hunting expeditions; and advising the broader community, with assistance from a council of elders (Levy 1978:487).

An array of seasonally available plant and animal species typically were collected for dietary, medicinal, and other requirements. A steady harvest was ensured by careful management of the land, such as through the practice of controlled burning of extensive areas to curb the spread of unwanted species and to promote the growth of seed-bearing plants and grazing area for game animals (Levy 1978; Lightfoot and Parrish 2009). Gathered in the fall, acorns were an important food source, especially acorns from Coast live oak (*Quercus agrifolia*), valley oak (*Q. lobata*), tanbark oak (*Lithocarpus densiflora*), and California black oak (*Q. kelloggii*). Berries, bulbs, greens, and the seeds from a number of plants also were consumed. Ohlone diet also included migratory waterfowl; terrestrial birds; large and small game, especially deer, elk, rabbit, and woodrat; sea mammals; fish, including steelhead, salmon, and sturgeon; reptiles; and insects. Many plant and animal species could be incorporated into other areas of Ohlone daily life; some were used for clothing, medicine, tools, cordage, and structures.

Ohlone material culture includes finely woven twined and coiled basketry, tule balsas, shell beads and ornaments, bone tools, and stone tools—created from Franciscan chert, obsidian, steatite, and other rocks or minerals (Levy 1978). Red ocher (cinnabar) could be procured from hills at present-day New Almaden. Houses were made from available materials, but in

most places in the San Francisco Bay Area they were hemispheric frames of bent willow poles covered with a thatch of tule, rush, or grass. Additional structures include sweathouses, dance enclosures, and large earth-covered assembly houses.

By the mid-1800s, Spanish missionization, diseases, raids by Mexican slave traders, and dense immigrant settlement had disrupted Ohlone culture, dramatically reducing the population, and displacing the native people from their villages and land-based resources. Reduction of Ohlone villages, conversion to Catholicism, and exposure to Spanish language, culture and material practices commenced with the establishment of Mission Santa Clara in early 1777 and the settlement of San Jose in the same year (Milliken 1995). The majority of Ohlones who joined Mission Santa Clara during the mid-1790s resided at seven main villages in the Santa Clara Valley, four of which probably contained more than 100 inhabitants (Milliken 2007:51–52). Milliken estimates by 1800 most native residents of the Santa Clara Valley had experienced severe psychological depression from the spread of epidemic diseases and witnessed environmental deterioration resulting from introduced grazing and farming practices. Spanish missions further eroded native cultural, social, and economic institutions, resulting in the elimination of perhaps 80 percent of native residents in the Bay Area.

At places like Alisal rancheria, near Pleasanton, Ohlone cultural practices endured as they regrouped and remade themselves, following the closure of Spanish missions and during subsequent periods of Mexican and American settlement. Although the Ohlone lost their original land base because of Spanish missionizing efforts, rancho allotments, and legal obstacles preventing favorable rulings in U.S. courts, their tribal status as the Verona Band was formally recognized by the U.S. Bureau of Indian Affairs as early as 1906. However, this status was short-lived and the Ohlone were "lost in a bureaucratic paper shuffle in Washington D.C." (Field et al. 2007:65). Assuming the Ohlone had ceded their lands and *rancherias*, they lost their federal status and are currently an unrecognized Native American tribe. Field et al. (2007) details the on-going Ohlone revitalization movement—and attempts to regain federal recognition—from the twentieth century up to the present day.

Historic-Period Background

The first mention of the Ohlone in historical records comes from the 1542 account of Juan Rodriquez Cabrillo, who sailed into Monterey Bay and observed some of California's native residents. Over 200 years later, an expeditionary force under the direction of Captain Gaspar de Portola traversed Ohlone lands on their way to the East Bay. After 1770, when the presidio of Monterey and Mission San Carlos Boromeo were founded, additional expeditions reached the South San Francisco Bay area. For example, a 1776 expedition headed by Juan Bautista de Anza reached the Guadalupe River and possibly crossed near Tamien Station in search of suitable locations for additional Spanish settlements (Hylkema 2007:34). At this time, Anza observed "the plains surrounding the Guadalupe River maintained large numbers of villages with a thriving Native American population" (Hylkema 2007:35). For this reason, Mission Santa Clara was established in 1777 and named *Santa Clara de Thamien*. The pueblo of *San Jose de Guadalupe* (San Jose Pueblo) was established later that year on the east side of the Guadalupe River. Flooding of the Guadalupe River in 1779 resulted in the relocation of the mission and it was renamed

Misión Santa Clara de Asís. After 1803, the area around Mission Santa Clara was designated as a rancho and used as pasture for livestock (Hylkema 2007:38).

With the establishment of the independent government of Mexico in 1821, Spanish missions were eventually secularized and former mission lands typically were allotted to wealthy Mexican citizens. Fifty grants of land were made in what is now Santa Clara County (Kyle 1990:404–411), including *Rancho San Ysidro* (Old Gilroy); *Rancho Los Tularcitos* (Milpitas); *Rancho Milpitas* (Milpitas); *Rancho Ulistac* (Agnew); R*ancho Patoría de las Borregas* (Mountain View and Sunnyvale); *Rancho Rincón de San Francisquito* (Palo Alto); *Rancho Rinconada del Arroyo de San Francisquito* (Palo Alto); *Rancho San Francisquito* (Stanford University); *Rancho San Antonio* (Los Altos); *Rancho Purísima Concepción* (Los Altos Hills); *Rancho Quito* (Saratoga); *Rancho Rinconada de los Gatos* (Los Gatos); *Rancho Santa Teresa* (San Jose); *Rancho El Potrero de Santa Clara* (San Jose); *Rancho Los Coches* (San Jose); *Rancho Las Animas* (Southern Santa Clara County); *Rancho Ojo de Agua de la Coche* (Morgan Hill); and *Rancho Cañada de Pala* (eastern Santa Clara County). The Peralta Adobe, constructed in 1777 and the oldest building in San Jose, was located in *Rancho San Antonio*. One rancho—*Rancho Polsomi*—contains several prehistoric shell mounds and was granted to an Ohlone Indian, Lope Ínigo, who chose to be buried in one mound after his death in 1864. Under Mexican law, settlement by non-Mexican citizens was permissible and soon immigrants from the U.S. settled in the Bay Area, although they often illegally squatted on rancho lands. Following the end of the Mexican-American War in 1848, California was admitted to the Union (1850), becoming the 31st state. For Mexican landowners, most of their property was subsequently lost to American settlers. Several present-day towns in Santa Clara County emerged from disbursed Mexican lands: Gilroy, Los Gatos, Milpitas, San Jose, and Santa Clara (Gudde 1969).

As the American Period began, an influx of new economies resulted in an increase in settlement and the development of farming, ranching, industry, and businesses in Santa Clara County. Santa Clara Valley's agricultural productivity was accelerated by 1) immigrants—especially of Italian origin—who arrived en masse to Santa Clara County around 1870 and became involved in one of the most productive fruit growing and distribution regions in the U.S. (Hylkema 2007:42), and 2) by technological innovations for irrigating crops and orchards. Significant alterations to watercourses within Santa Clara Valley during the historic period are potentially seen archaeologically (artifacts, features, and structural foundations) as a growing Bay Area population settled by and increasingly drew from available freshwater sources. By 1919, at least ten fruit and vegetable canning plants were operating in Santa Clara County, and the region's fruit packing industry peaked in the 1930s with 30 packing plants operating in the county. The Town of Campbell, founded in 1885, was at one time the center of the fruit-growing and canning industry in Santa Clara County (Kyle 1990). After the booming agricultural economy of the 1930s, Santa Clara County focused on technology with the founding of Hewlett Packard and Fairchild Semiconductor. The area is now synonymous with the term "Silicon Valley," and is the location of several of the world's leading computer, microprocessor, and Internet companies.

Santa Clara County Water History

In the 1920s, persistent flooding, growing communities, and agricultural productivity in Santa Clara County led farmers and community leaders to petition for the creation of a water conservation committee for controlling and managing the valley's water resources. At that time, the Santa Clara Valley Water Conservation Committee was formed, and it subsequently spearheaded the establishment of the Santa Clara Valley Water Conservation District in 1929. Since that time, reservoirs have been constructed to alleviate problems associated with periodic droughts and slow rapidly dropping groundwater levels. In 1952, the County Board of Supervisors formed the Santa Clara County Flood Control and Water Conservation District. In the 1970s, the Santa Clara County Flood Control District changed its name to the Santa Clara Valley Water District, with responsibilities for providing water supply and flood management (SCVWD 2010).

Paleontological Resources

The Santa Clara Valley contains a diverse record of geologic and biologic history, spanning more than 150 million years, and dates from the Jurassic Period to the present. The processes of multiple tectonic influences (faulting, uplift, sedimentary deposition, sea level fluctuations) have combined to create a significant record of both marine and terrestrial fossils in the Project Area. (Santa Clara County Parks and Recreation Department 2006)

Much of the paleontological interest in the region is caused by discoveries of fossilized Pleistocene vertebrates from Quaternary deposits in the South San Francisco Bay Area. Descriptions of these fossil vertebrates have provided scientists with one of the most complete records of Pleistocene fauna in California. (Santa Clara County Parks and Recreation Department 2006)

Fossil mammal assemblages have been collected from Quaternary sediments bordering South San Francisco Bay: the Lawrence Expressway Site, the Cupertino–Calabasas Site, and a site near the Anderson Dam–Morgan Hill vicinity. All of these sites have produced fossil elephant, camel, and bison specimens. Stratigraphic occurrences of sandstone, clay, and silt lithologies that are exceptional for preserving vertebrate and microvertebrate taxa have been assigned to the Pleistocene Quaternary alluvium units. Such Quaternary alluvium and Quaternary undifferentiated deposits occur locally within the Project Area and can occur in stream, terrace, fluvial, alluvial fan, floodplain, slope debris, and ravine fill deposits. However, urban development certainly has obscured or removed portions of many of these deposits. (Santa Clara County Parks and Recreation Department 2006)

Sediments of Holocene age that form thin surficial cover are considered to be of little paleontological interest and are, therefore, considered to possess low sensitivity for fossil specimens. (Santa Clara County Parks and Recreation Department 2006)

Specific to the Proposed Project channels, in 2005, a fossil of a young Columbian mammoth (*Mammuthus columbi*) was found on a floodplain/overflow area east of the Guadalupe River downstream of Trimble Road in San Jose, just north of Mineta San Jose International Airport. The fossil dates from the late Pleistocene epoch and included portions of skull,

tusks, molar teeth, femur, toes, ribs, and other bone fragments. (Children's Discovery Museum of San Jose 2011; University of California Museum of Paleontology 2005)

Previous Surveys

Pre-construction surveys and assessments of areas surrounding proposed maintenance activity areas were conducted in 2002–2011 by State Parks Archaeologist Mark Hylkema, in accordance with the 2002 SMP EIR. In Archaeological Survey Reports (ASRs) presented annually to SCVWD from 2002 onward, Hylkema has discussed specific project locales, described proposed ground-disturbing activities within each, and evaluated the likelihood of encountering cultural resources within each proposed activity work site. These evaluations were based on the results of record and archival searches conducted at the Northwest Information Center of the California Historical Resources Information System (CHRIS) at Sonoma State University and augmented by data retained by Hylkema. Areas in which the removal of sediment within existing stream profiles was proposed and/or areas near known cultural resources were deemed potentially sensitive, and Hylkema consequently has recommended cultural resource monitoring by a qualified archaeologist in those locations.

For the current SMP, a monitoring program was implemented by Albion Environmental, Inc. in 2002–2003, and by Pacific Legacy, Inc. in 2004–2010, for those locations deemed potentially sensitive in ASR reports provided by Mark Hylkema. Ground-disturbing activities for which cultural resource monitors were required included vegetation removal, silt or sediment removal, the removal of previously installed stream maintenance features (such as concrete rip-rap or tailings), the installation of bank protection features (such as rock weirs or retaining walls), and stream channel widening or rerouting. Historic or temporally indeterminate debris was noted at many of the locations monitored between 2002 and 2010; however, most of these items were observed in transposed secondary contexts and few yielded in situ cultural materials. Exceptions included a historic debris scatter discovered along Permanente Creek, an isolated prehistoric boulder mortar found along Alamitos Creek at Bubblingwell Place, and in situ human remains recovered from Adobe Creek at O'Keefe Lane. All in situ discoveries were recorded on DPR Form 523 and fully documented. Only one inadvertent discovery was recorded under the current SMP: the historic barge found in the Alviso Slough in 2010. It was fully documented according to the standards of the Historic American Engineering Record and monitored during ground-disturbing activities. A summary of the findings of the monitoring program is provided in Table 3.4-1.

Table 3.4-1. Cultural Resource Monitoring for the SCVWD SMP, 2002-2010

Contractor and Year Work Performed	Monitoring Locations	Results
Albion Environmental, Inc. (2002)	Thompson Creek near Aborn Road	Negative
	Guadalupe River near W. Alma	Negative
	San Thomas Aquinas Creek near Avon	Negative
	Adobe Creek at Moos Family Property	Negative
	Adobe Creek at Ward Family Property	Negative
Albion Environmental, Inc. (2003)	Thompson Creek at Quimby Road	Negative
	Thompson Creek at Pettigrew Drive	Negative
	Thompson Creek at Quimby Creek	Negative
	Thompson Creek near Aborn Road	Negative
	Wildcat Creek at Montpere Way and Quito Road	Negative
	Hale Creek at Gronwall Lane	Negative
	Prospect Creek at Blue Hills Drive	Negative
	Matadero Creek at Page Mill Road	Negative
Pacific Legacy, Inc. (2004)	Saratoga Creek at Walnut Avenue	Negative
	Alamitos Creek near Graystone Lane	Negative
	Berryessa Creek at Piedmont Avenue	Negative
	Canoas Creek near Cottle Road	Negative
	Saratoga Creek near Civic Center	Negative
	Golf Creek	Negative
Pacific Legacy, Inc. (2005)	Canoas Creek Upstream from Hillsdale Avenue	Negative
	Guadalupe River Upstream from Trimble Road	Negative
	Adobe Creek Upstream from El Camino Real	Negative
	Guadalupe River Upstream from Coleman Avenue	Negative
	Guadalupe River Upstream from Highway 101	Negative
	Saratoga Creek Downstream from Warburton Ave.	Negative
	Permanente Creek near Deer Meadow Trail	Negative
Pacific Legacy, Inc. (2006)	Adobe Creek downstream from Foothill Expressway	Negative
	Permanente Creek, Rancho San Antonio Preserve	Permanente Historic Trash Scatter
	Hale Creek Upstream from Foothill Expressway	Negative
Pacific Legacy, Inc. (2007)	Greystone Creek at Olive Branch Lane	Negative
	Alamitos Creek at Bubblingwell Place	PL- SCVWD-ABO -ISO01
	Adobe Creek at O'Keefe Lane	PL- SCVWD-ACO -ISO01
	Alamitos Creek at Greystone Creek Confluence	Negative
	Alamitos Creek at McKean Road	Negative
Pacific Legacy, Inc. (2008)	Adobe Creek at O'Keefe Lane, Los Altos	Negative
	Berryessa Creek near Cropley Avenue	Negative
	Guadalupe River at West Alma Avenue	Negative
	Alamitos Creek at Greystone Creek	Negative
	Alamitos Creek near Brett Hart Road	Negative
	Alamitos Creek at Greystone Lane	Negative
	Alamitos Creek near Almaden Expressway	Negative

Contractor and Year Work Performed	Monitoring Locations	Results
Pacific Legacy, Inc. (2009)	Saratoga Creek near Warburton Bridge Guadalupe River near Ross Creek Confluence Thompson Creek near Everdale Drive Alamitos Creek near Alamaden Expressway Alamitos Creek near Fieldwood Court Thompson Creek near Farnsworth Road Alamitos Creek at Randol Creek	Negative Negative Negative Negative Negative Negative Negative
Pacific Legacy, Inc. (2010)	Santa Teresa at San Vincente Avenue Calabazas Creek near Padero Court South Bay Advanced Recycled Water Treatment Facility Project Excavations Alviso Slough	Negative Negative Negative Historic Alviso Barge

Source: Albion Environmental, Inc. 2002, 2003; Pacific Legacy, Inc. 2004–2010

3.4.4 Impact Analysis

Methodology

CEQA requires assessment of a project's potential effects on historical resources, as defined in Section 15064.5 of the State CEQA Guidelines (see below). In general, historical resources are those listed or eligible for inclusion on the CRHR or in a local register, or identified based on a survey that meets the requirements of Sections 5020.1 (k) and 5024.1(g) of the California Public Resources Code. The identification of historical resources involves several steps, including: identifying cultural resources within a project's boundaries; evaluating the resources to determine if they qualify as historical resources; and determining the direct or indirect effects of the project on significant historical resources. Resources found not to be "historical resources" or otherwise "historically significant" need no further management. In general, effects on significant CEQA resources can be reduced to less-than-significant levels by applying the proper treatment or management measures, such as avoidance, further documentation, evaluation for eligibility to be included on the CRHR, or data recovery.

As discussed above under 3.4.3, *Environmental Setting,* the potential for the occurrence of prehistoric and historic cultural resources generally is high along existing waterways. Furthermore, because of alluvial flooding along waterways, the potential for buried cultural deposits is high. Several components of the Proposed Project would require ground-disturbing activities that could disturb previously documented or unknown and potentially important prehistoric and historic cultural resources. The Proposed Project would not include any activities that could affect buildings, so an evaluation of buildings was not undertaken as part of this analysis. Although rare, paleontological resources also may be located in areas where ground-disturbing activities would occur under the Proposed Project, and thus it is possible that Proposed Project activities could unearth and damage previously undiscovered paleontological resources.

An analysis of the types of activities to be undertaken and their potential impacts on cultural and paleontological resources is provided below. These or similar activities have been occurring on SCVWD-maintained canals and channels for many years. The 2002 SMP EIR provided a programmatic approach to reducing impacts to cultural resources to less-than-significant levels. Treatment measures proposed for the current SMP included pre-construction surveys and preparation of an Archaeological Survey Report, avoidance, monitoring, evaluation of finds, data recovery, and protocols for inadvertent discoveries.

Potential Effects of SMP Activities

Routine activities undertaken as part of the Proposed Project include bank stabilization, sediment removal, vegetation management, management of animal conflicts, minor maintenance, canal maintenance, and sediment reuse/disposal. These routine activities include varying degrees of ground-disturbing activities which may affect cultural resources. Ground-disturbing and construction activities could adversely affect previously documented or unknown potentially important cultural resources, resources determined to be historic properties, or paleontological resources. Certain activities proposed by the SCVWD do not have the potential to disturb native soils and therefore do not have the potential to impact historic properties. , Proposed Project activities have therefore been divided into two categories: (1) activities that will disturb native soils by excavation, construction, or sediment disposal; and (2) activities that will not disturb native soils.

The first category applies to maintenance activities required for bank stabilization, sediment removal, vegetation management, and minor maintenance which require the disturbance of native soils by excavation and/or construction. These include bank stabilization, culvert replacement, stream channel or canal access, channel or canal clearing, sediment removal, hazardous tree removal, and the reuse of sediments for habitat restoration. Where cultural resources are present in native soils, disturbance of these native soils has the potential to impact such resources.

The second category consists of activities such as those that are accomplished from the top of bank, those conducted in imported fill material, those involving the use of handheld equipment, or those involving other non-ground-disturbing activities (e.g., management of animal conflicts). These activities do not have the potential to disturb native soils and therefore would not impact cultural resources. These activities do not require any additional assessment.

Criteria for Determining Significance

Defining Significant Cultural Resources

A resource is considered a historical resource if it qualifies as eligible for listing in the CRHR, included in a local register of historical resources, determined by the lead agency to be historically significant, or meets the criteria found in PRC 5024.1 (g).

Properties that are eligible for listing in the CRHR must meet one or more of the following criteria:

- Criterion 1: Association with events that have made a significant contribution to the broad patterns of California's history and cultural heritage ;
- Criterion 2: Association with the lives of persons important in our past;
- Criterion 3: Embodying the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values; or
- Criterion 4: Has yielded, or may be likely to yield, information important in prehistory or history.

The CRHR interprets the integrity of a cultural resource as its physical authenticity. An historic cultural resource must retain its historic character or appearance and thus be recognizable as an historic resource. Integrity is evaluated by examining the subject's location, design, setting, materials, workmanship, feeling, and association. If the subject has retained these qualities, it may be said to have integrity. It is possible that a cultural resource may not retain sufficient integrity to be listed in the NRHP yet still be eligible for listing in the CRHR. If a cultural resource retains the potential to convey significant historical/scientific data, it may be said to retain sufficient integrity for potential listing in the CRHR. Most significant Native American prehistoric sites are eligible because of their age, scientific potential, and/or burial remains. A historical resource also may be one that is included in a local register of historical resources, as defined in section 5020.1(k) of the PRC or identified as significant in a historical resource survey meeting the requirements of section 5024.1 (g) of the PRC. Objects, buildings, structures, sites, areas, place, record, or manuscripts can also be considered an historical resource if the lead agency determines that the resource is historically significant. The lead agency is tasked with providing substantial evidence for this determination generally following the criteria for listing on the CRHR

A resource can also be considered a historical resource if it is identified in a historical resource survey and listed on the CRHR if it meets four criteria. These include 1) the survey has been or will be included in the State Historic Resources Inventory; 2) the report and documentation are prepared by accepted standards; 3) the resource is evaluated and determine to have a significance rating of 1 to 5 on the DPR Form 523; and, 4) the survey is updated if more than 5 years old to determine if the present condition of the resource (PRC Section 5024.1[g]).

Thresholds of Significance

For the purposes of this analysis, the Proposed Project would result in a significant impact on cultural resources if it would:

A. cause a substantial adverse change in the significance of a historical or archaeological resource as defined in Section 15064.5;

B. directly or indirectly destroy a unique paleontological resource or site; or

C. disturb any human remains, including those interred outside of formal cemeteries.

Definitions of "historical resource," "archaeological resource," and "substantial adverse change", as used in the State CEQA Guidelines, are summarized below.

Historical Resource

Section 15064.5 of the State CEQA Guidelines defines "Historical resource" as:

- A resource listed in or determined to be eligible by the State Historical Resources Commission for listing in the CRHR (mandatory significance).
- A resource included in a local register of historical resources or identified as significant in an historical resource survey unless the preponderance of evidence suggests it is not significant (presumptive significance).
- In the absence of a federal, state, or local listing, if substantial evidence demonstrates its significance (discretionary significance). This includes any object, building, structure, site, area, place, record, or manuscript which a lead agency determines to be historically significant or significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California. Generally, a resource shall be historically significant if it:
  - Is associated with events that made a significant contribution to the broad patterns of California's history and cultural heritage.
  - Is associated with the lives of people important in our past.
  - Embodies the distinctive characteristics of a type, period, region, or method of construction, represents the work of an important creative individual, or possesses high artistic values.
  - Has yielded or may be likely to yield information important in prehistory or history.

Substantial Adverse Change

Section 15064.5 of the State CEQA Guidelines defines "substantial adverse change" as:

- Physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of an historical resource would be materially impaired.
- Demolition or material alteration in an adverse manner of those physical characteristics of an historical resource which convey its historical significance and justify its inclusion in or eligibility for inclusion in the CRHR inclusion in a local register, or identification in a historical resources survey.

Environmental Impacts

Impact CR-1: Disturbance to Known and Previously Undiscovered Archaeological or Historic Resources (Significance Criterion A; Less than Significant)

Ground-disturbing maintenance activities conducted under the Proposed Project would have the potential to disturb known or previously undiscovered cultural resources within the Project Area. Archeological Survey Reports and recommendations have been performed for the current SMP since 2002, and they are used as a reference for proposed maintenance activities..

Sediment Removal and Bank Stabilization

Sediment removal and bank stabilization activities would involve ground disturbances of creek channels and banks in the Project Area, for implementation of the activities themselves and the potential construction of temporary access routes. Ground disturbances associated with these activities could adversely impact known or previously undiscovered important archaeological or historic resources. Project sediment removal or bank stabilization activities could result in alteration of the elements of these resources that made them eligible for the CRHR, or could result in a substantial change in the significance of a historical resource. The majority of these activities would be conducted in canals or modified or engineered channels; therefore, any undiscovered resources may have already been altered or destroyed during canal or channel construction or historic maintenance activities. Nevertheless, stream channels are areas that are considered highly sensitive for the presence of cultural resources, and although most work would not extend below as-built conditions, work conducted in native soils below the engineered channel could encounter previously undiscovered deposits.

Other Maintenance Activities

All other categories of maintenance (vegetation management, minor maintenance, management of animal conflicts, and canal maintenance) include ground-disturbing activities that could affect known or previously undiscovered archaeological or historic resources. Specifically, vegetation management activities include discing. Minor maintenance activities include minor sediment removal or grading. Management of animal conflicts could include physical alterations of habitat (ex., reconstruction of levee side slopes or surface compaction of levee faces). Because routine canal maintenance activities would include all general work activities, effects would be the same as described above for other routine maintenance activities. The effects of these other maintenance activities on known or unknown archaeological or historic resources would be similar to those described for sediment removal and bank stabilization activities.

Applicable Best Management Practices

The following BMPs would be implemented as part of the SMP update to minimize the potential for disturbances to archaeological or historic resources. Descriptions of each BMP are provided in Chapter 2, *Project Description*.

BMP GEN-40: Discovery of Cultural Remains or Historic or Paleontological Artifacts
BMP GEN-41: Review of Projects with Native Soil

Conclusion

By implementing these BMPs, known cultural resources would be identified, flagged, and avoided, and procedures would be followed to minimize impacts on previously unknown archaeological or historic resources. This impact would be less than significant and no mitigation would be required.

Mitigation Measures: No mitigation is required.

Impact CR-2: Discovery of Human Remains (Significance Criterion C; Less than Significant)

Ground-disturbing maintenance activities conducted under the Proposed Project would have the potential to unearth human remains, including Native American remains.

Sediment Removal/Bank Stabilization

As described above, sediment removal and bank stabilization activities would involve ground-disturbing activities. These activities could affect Native American remains. Native Americans consider the remains of their ancestors and the offerings buried with them to be sacred and wish to prevent the disturbance of interments. Any non-Native American remains would need to be considered as well.

Other Maintenance Activities

Other proposed maintenance activities (vegetation management, minor maintenance, management of animal conflicts, and canal maintenance) would, in some cases, also involve ground-disturbing activities that could potentially affect Native American remains.

Applicable Best Management Practices

The following BMP would be implemented as part of the SMP Update to appropriately respond to the discovery of human remains. A description of this BMP is provided in Chapter 2, *Project Description*.

BMP GEN-40: Discovery of Cultural Remains or Historic or Paleontological Artifacts

Conclusion

By implementing this BMP, any human remains would be dealt with in a respectful and appropriate manner. As a result, this impact would be less than significant and no mitigation would be required.

Mitigation Measures: No mitigation is required.

Impact CR-3: Impacts to Sensitive Paleontological Resources as a Result of Maintenance Activities (Significance Criterion B; Less than Significant)

The Proposed Project could affect known or unknown paleontological resources during ground-disturbing or excavation activities.

Sediment Removal/Bank Stabilization

Because the majority of sediment removal and bank stabilization activities would be conducted in channels and canals that have been modified from their natural condition, they would not be expected to contain geologic material with a high likelihood of containing paleontological resources. As such, the discovery of paleontological resources during Proposed Project activities is extremely unlikely. However, activities that would result in excavation of native soils, such as bank stabilization, could uncover previously undiscovered paleontological resources.

Other Maintenance Activities

Other proposed maintenance activities (vegetation management, minor maintenance, management of animal conflicts, and canal maintenance) could involve ground-disturbing activities, including potential excavation of native soils. The potential effects of these activities on known or undiscovered paleontological resources would be similar to that described for sediment removal and bank stabilization activities.

Applicable Best Management Practices

The following BMPs would be implemented as part of the SMP Update to minimize the potential for impacts to sensitive paleontological resources. Descriptions of each BMP are provided in Chapter 2, *Project Description*.

BMP GEN-40: Discovery of Cultural Remains or Historic or Paleontological Artifacts
BMP GEN-41: Review of Projects with Native Soils

Conclusion

These BMPs would include stop-work and treatment measures in the event of a discovery of paleontological resources. As a result, this impact would be less than significant and no mitigation would be required.

Mitigation Measures: No mitigation is required.

Chapter 3.5

GLOBAL CLIMATE CHANGE

3.5 Global Climate Change

3.5.1 Introduction

This section presents the regulatory setting, environmental setting, and potential impacts of the Proposed Project as related to climate change.

Data sources used in the preparation of this section include state and federal regulations and reference materials from the Bay Area Air Quality Management District (BAAQMD). Concepts and terminology that are in Section 3.2, *Air Quality* also are applicable in this section. This discussion analyzes air quality impacts over the entire duration of the existing SMP and proposed SMP Update.

3.5.2 Regulatory Setting

Federal Plans, Policies, Regulations, and Laws

Climate change and GHG reduction also are a concern at the federal level; however, at this time, no legislation or regulations have been enacted specifically addressing GHG emissions reductions and climate change.

State Plans, Policies, Regulations, and Laws

Assembly Bill 1493

In 2002, Assembly Bill 1493 (AB 1493) launched an innovative and pro-active approach to dealing with greenhouse gas (GHG) emissions and climate change at the state level. AB 1493 requires that the California Air Resources Board (CARB) develop and implement regulations to reduce automobile and light truck GHG emissions; these regulations apply to automobiles and light trucks beginning with the 2009 model year.

Executive Orders S-3-05 and S-20-06/Global Warming Solutions Act—Assembly Bill 32

AB 1493 cited several potential risks that California faces from climate change, including reduction in the state's water supply, increased air pollution created by higher temperatures, harm to agriculture, increase in wildfires, floods, damage to the coastline, and economic losses caused by higher food, water, energy, and insurance prices.

On June 1, 2005, former Governor Schwarzenegger signed Executive Order S-3-05. The goal of this Executive Order is to reduce California's GHG emissions to: (1) 2000 levels by 2010; (2) 1990 levels by 2020; and (3) 80 percent below the 1990 levels by 2050. In 2006, this goal was further reinforced with the passage of AB 32, the Global Warming Solutions Act of 2006. AB 32 sets the same overall GHG emissions reduction goals as the Governor's Executive Order, while further mandating that CARB create a plan (including market mechanisms), and implement rules to achieve "real, quantifiable, cost-effective reductions of greenhouse gases." Executive Order S-20-06 further directs state agencies to begin implementing AB 32, including the recommendations made by the State's Climate Action

Team. No later than January 1, 2012, CARB must adopt rules and regulations to implement GHG emissions reductions.

Senate Bill 97 and CEQA

In 2007, Senate Bill 97 (SB 97) was adopted to provide greater certainty to lead agencies that GHG emissions and the effects of GHG emissions are appropriate subjects for CEQA analysis. Pursuant to SB 97, the California Natural Resources Agency adopted amendments to the State CEQA Guidelines to address analysis and mitigation of the potential effects of GHG emissions in CEQA documents and processes. These amendments became effective on March 18, 2010. Topics of the amendments include but are not limited to (California Natural Resources Agency 2010):

- requiring a lead agency to make a good-faith effort, based to the extent possible on scientific and factual data, to describe, calculate, or estimate the amount of greenhouse gas emissions resulting from a project;
- requiring a lead agency to consider the project's effect on GHG emissions in comparison to the existing setting, an exceedance of a significance threshold by the project, and the extent to which the project complies with adopted regulations or requirements among others, when assessing the significance of impacts from greenhouse gas emissions on the environment;
- identifying types of suitable/applicable mitigation measures for GHG emissions; and
- allowing project-specific environmental documents to tier from and/or incorporate by reference any existing programmatic review of GHG emissions, such as in a general plan, a long range development plan, or a separate plan to reduce GHG emissions.

Actions Taken by California Attorney General's Office

The California Attorney General (AG) has filed comment letters under CEQA about a number of proposed projects. The AG also has filed several complaints and obtained settlement agreements for CEQA documents covering general plans and individual programs that the AG found either failed to analyze GHG emissions or failed to provide adequate GHG mitigation. The AG's office has prepared a report that lists measures that local agencies must consider under CEQA to offset or reduce global warming impacts. Information on the AG's actions can be found on the State of California Department of Justice, Office of the Attorney General's Web site (California Department of Justice 2008).

Regional and Local Plans, Policies, Regulations, and Ordinances

CARB has designated 15 air basins in the state. Thirty-five local air quality management districts are responsible for attainment and permitting in each basin and subbasin area. Santa Clara County is located in the San Francisco Bay Area Air Basin. The BAAQMD oversees planning and permitting in the nine-county Bay Area, including Santa Clara County.

Bay Area 2010 Clean Air Plan

The BAAQMD adopted a new clean air plan, the Bay Area 2010 Clean Air Plan, in September 2010. The purposes of the plan are to: provide a control strategy to reduce greenhouse gases in a single, integrated plan; review progress in improving air quality in recent years; and establish emission control measures to be adopted or implemented in the 2010–2012 timeframe (BAAQMD 2011).

BAAQMD CEQA Air Quality Guidelines/ Significance Thresholds

The BAAQMD published CEQA guidelines to aid assessment of air quality impacts in 2011 (BAAQMD 2011). The guidelines address evaluating air quality impacts and their significance, and developing mitigation measures for significant impacts. The guidelines focus on criteria air pollutant, GHG, toxic air contaminant, and odor emissions generated from plans or projects. Table 3.5-1 provides the guidelines-recommended significance criteria for analysis of project-related GHG impacts. Based on discussions with the BAAQMD, the BAAQMD's operational CEQA significance thresholds are most appropriate for the Proposed Project (Michael, pers. comm., 2010).

Table 3.5-1. Applicable BAAQMD CEQA Thresholds of Significance for Greenhouse Gases

Pollutant	Operational Significance Thresholds
GHGs—projects other than stationary sources	a) Compliance with qualified GHG reduction strategy **OR** b) 1,100 metric tons (MT) of carbon dioxide equivalent (CO_2e) per year **OR** c) 4.6 MT CO_2e/service population (residents and employees) per year

Source: BAAQMD 2011

3.5.3 Environmental Setting

This section discusses greenhouse gases and anticipated climate change conditions in the Project Area.

Greenhouse Gases and Climate Change

Anthropogenic emissions of greenhouse gases are widely accepted in the scientific community as contributing to global warming. According to *Climate Change 2007: The Physical Science Basis: Summary for Policymakers* (Intergovernmental Panel on Climate Change [IPCC] 2007), there is no doubt that the climate system is warming. Global average air and ocean temperatures, as well as global average sea level, are rising. The period from 1995 through 2006 ranked as among the warmest on record since 1850. Although some of the increase is explained by natural occurrences, the 2007 report asserts that the increase in temperature is very likely (greater than 90 percent) caused by human activity, most notably the burning of fossil fuels.

For California, similar effects are described in *Our Changing Climate: Assessing the Risks to California* (California Climate Change Center 2006). Based on projections using state of the art climate modeling, temperatures in California are expected to rise between 3°F and 10.5°F (1.7°C and 5.8°C) by the end of the century, depending on how much California and the rest of the globe are able to reduce their GHG emissions. The report states that these temperature increases will negatively impact public health, water supply, agriculture, plant and animal species, and the coastline.

Climate change is a global problem, and GHGs are global pollutants, unlike criteria air pollutants (such as ozone precursors) and toxic air contaminants, which are pollutants of regional and local concern. Worldwide, California is the 12th to 16th largest emitter of CO_2 (California Energy Commission 2006), and is responsible for approximately 2 percent of the world's CO_2 emissions (California Energy Commission 2006).

The IPCC was commissioned by the World Meteorological Organization and United Nations Environment Program to assess scientific, technical, and socio-economic information relevant to the understanding of climate change, its potential impacts, and options for adaptation and mitigation. The IPCC predicts that substantial increases in temperatures globally may affect the natural environment in California in the following ways:

- rising sea levels along the California coastline, particularly in San Francisco and the San Joaquin Delta caused by ocean expansion;
- extreme-heat conditions, such as heat waves and very high temperatures, which could last longer and become more frequent;
- an increase in heat-related human deaths, infectious diseases, and a higher risk of respiratory problems caused by deteriorating air quality;
- reduced snow pack and stream flow in the Sierra Nevada, affecting winter recreation and water supplies;
- potential increase in the severity of winter storms, affecting peak stream flows and flooding;
- changes in growing season conditions that may affect California agriculture, causing variations in crop quality and yield; and/or
- changes in distribution of plant and wildlife species because of changes in temperature, competition from colonizing species, changes in hydrologic cycles, changes in sea levels, and other climate-related effects.

These changes in California's climate and ecosystems are occurring at a time when California's population is expected to increase from 34 million to 59 million by 2040 (California Energy Commission 2006). Therefore, the number of people potentially affected by climate change as well as the amount of anthropogenic GHG emissions anticipated under a "business as usual" scenario is expected to increase. Similar changes as those noted above for California also are expected occur in other parts of the world, with regional variations in resources affected and vulnerability to adverse effects.

GHG emissions in California are attributable to human activities associated with industrial/manufacturing, utilities, transportation, residential, and agricultural sectors (California Energy Commission 2006) as well as natural processes. Transportation is responsible for 41 percent of the state's GHG emissions, followed by the industrial sector (23 percent), electricity generation (20 percent), agriculture and forestry (8 percent) and other sources (8 percent) (California Energy Commission 2006). Emissions of CO_2 and N_2O are byproducts of fossil fuel combustion, among other sources. Methane, a highly potent GHG, results from off-gassing associated with agricultural practices and landfills, among other sources. Sinks of CO_2 include uptake by vegetation and dissolution into the ocean.

3.5.4 Impact Analysis

Methodology

Although SMP Update activities would be countywide, transitory, and short term, similar to construction activities, they would serve the purpose of maintaining existing features rather than constructing new features. Therefore, as discussed above, the BAAQMD has indicated that emissions resulting from SMP Update activities would be considered to be operational emissions for the purposes of estimating air quality impacts. Air emissions from SMP Update activities were estimated for three sources: off-road vehicles, on-road vehicles, and pesticide use. Off-road vehicle emissions were estimated using equipment data and CARB's OFFROAD 2007 model. On-road vehicle emissions were estimated using vehicle miles traveled (see Section 3.12, *Traffic and Transportation*) and CARB's EMFAC 2007 model. The GHG emissions from pesticide use under the Proposed Project would be extremely small in the context of the overall Proposed Project emissions. Therefore, they were not included in the emissions calculations and are not anticipated to result in any material change in the magnitude of the impact.

The BAAQMD CEQA Guidelines provide the thresholds of significance for GHG emissions based on carbon dioxide equivalents (CO_2e), which consists of emissions of carbon dioxide, methane (CH_4), nitrous oxide (N_2O) and hydrofluorocarbons (HFC). The EMFAC 2007 and OFFROAD 2007 models estimate only carbon dioxide (CO_2) emissions. The U.S. Environmental Protection Agency estimates that, on average, CH_4, N_2O, and HFC constitute 5 percent of GHG emissions from automobiles and CO_2 constitutes the remaining 95 percent (USEPA 2010). Using this assumption, CO_2e emissions were estimated based on modeled CO_2 emissions.

Criteria for Determining Significance

For the purposes of this analysis, the Proposed Project would result in a significant impact on global climate change if it would:

A. generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment; or

B. conflict with an applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases.

Note that emissions associated with the Proposed Project were estimated for the various maintenance activities as a whole; for this reason, the impact discussion in this section is not broken down by the individual activities.

Environmental Impacts

Impact GCC-1: Temporary Increase in Greenhouse Gases during Maintenance Activities (Significance Criteria A, B; Less than Significant with Mitigation or Significant and Unavoidable)

Use of vehicles and equipment for Proposed Project maintenance activities would require fossil fuel combustion that would generate GHG emissions.

This analysis considers emissions from both existing SMP activities (conducted pursuant to the 2002 SMP EIR) and additional emissions resulting from implementation of the Proposed Project (SMP update from 2012 to 2022). The existing SMP allows the majority of maintenance activities to be conducted between June 15 and October 15, although some activities occur year-round. The Proposed Project would extend the period when maintenance activities could be conducted (for those not occurring year-round), from October 15 to December 31.

Table 3.5-2 summarizes average daily CO2e operational emissions for 2012 and 2020. For additional information on how emissions were estimated refer to Appendix E. Daily CO2e emissions would decrease between 2012 and 2020, primarily because the California Air Resources Board's Low Carbon Fuel Standard (LCFS) is expected to reduce CO2e emissions from vehicles by a total of 7.2 percent by 2020. CO2e emissions reductions from LCFS would occur through SCVWD's tiered vehicle replacement program.

Table 3.5-2. 2012 and 2020 Average Daily CO_2e Emissions

Emissions Source	2012 Estimate (pounds per day)	2020 Estimate pounds per day
Off-Road	48,565.7	41,824.0
On-Road	16,042.9	15,041.0
Pesticide Use	-	-
Total	*64,608.6*	*56,865.0*
BAAQMD Threshold	None	

Note: Daily vehicle trips and vehicle miles traveled would remain the same in the SMP Update as in the existing SMP.
Source: Data compiled by Horizon Water and Environment in 2011

Table 3.5-3 shows the Proposed Project's estimated annual CO_2e emissions. For additional information on how emissions were estimated refer to Appendix E. Annual emissions from the SMP Update would increase because of the extended work window, during which an additional 25 percent of work is estimated to be completed. This increase would be offset somewhat by a 7.2 percent emissions decrease, associated with the LCFS.

Table 3.5-3. 2012 and 2020 Annual CO_2e Emissions

Emissions Source	2012 Estimate (metric tons per year)	2020 Estimate (metric tons per year)
Existing SMP		
Off-Road	1,873.0	1,613.0
On-Road	1,892.5	1,774.3
Pesticide Use	-	-
Total	*3,765.5*	*3,387.3*
Additional Emissions under the SMP Update (2012-2022)		
Off-Road	468.2	403.2
On-Road	129.4	126.7
Pesticide Use	-	-
Total	*597.7*	*529.9*
Total SMP		
Off-Road	2,341.2	2,016.2
On-Road	2,022.0	1,901.0
Pesticide Use	-	-
Total	*4,363.2*	*3,917.3*
BAAQMD threshold	**1,100**	

Source: Data compiled by Horizon Water and Environment in 2011

Applicable Best Management Practices

The following BMPs would be implemented as part of the SMP Update, which would reduce GHG emissions during maintenance activities, although the exact extent cannot be quantified. Descriptions of each BMP are provided in Chapter 2, *Project Description*.

BMP GEN-4: Minimize the Area of Disturbance
BMP GEN-29: Dust Management

Conclusion

Table 3.5-3 shows that annual emissions of GHGs from the SMP Update would be greater than BAAQMD operational significance thresholds. GHG emissions in exceedance of BAAQMD significance thresholds would be considered a potentially significant impact. The District would implement Mitigation Measure AIR-1A, which would reduce NOx emissions by 20 percent, and also may reduce other GHG emissions. Although possible, this measure is not expected to reduce GHG emissions below the threshold. Therefore, this impact would remain significant after this mitigation.

Therefore, the District would implement either Mitigation Measure GCC-1A or GCC-1B, or a combination of both measures, to offset annual GHG emissions in exceedance of BAAQMD significance thresholds. Implementation of either Mitigation Measure GCC-1A or GCC-1B, or a combination of both measures, would reduce this impact to a less-than-significant level. However, it is possible that these mitigation measures may not be feasible because of the factors discussed below. If the District found these mitigation measures to be infeasible, then this impact would be considered significant and unavoidable.

Mitigation Measures: GCC-1A On-site or Off-site GHG Emissions Mitigation Program

In recent years, SCVWD has reduced its GHG emissions on several projects, including production of energy from SCVWD-owned renewable sources. As a result, SCVWD has GHG emissions credits that have not been previously applied as reductions/offsets for GHG emissions. SCVWD also may establish a new program to implement off-site GHG emissions reduction projects within the SFBAAB to obtain the new emissions credits. SCVWD will use existing or new emissions credits to reduce/offset GHG emissions from the SMP in exceedance of BAAQMD operational significance thresholds.

The total credits will be equal to the average emissions above the threshold over the lifetime of the SMP Update, or 30,402 metric tons (the average exceedance between the 2012 and 2020 estimated emissions, multiplied by 10 years), as adjusted based on the emissions reductions achieved by Mitigation Measure AIR-1A. The GHG emission reductions credits/projects will be from sources of emissions that are not required by any existing law to reduce their GHG emissions. Offsetting annual emissions inherently includes offsetting daily emissions. Therefore, no additional reductions/offsets will be required for daily GHG emissions. Documentation of any existing or new GHG reductions/offsets will be provided to the BAAQMD. In addition, any existing or new SCVWD GHG offset credits accounted for under this mitigation measure will be verified by the Climate Action Reserve so that the offsets are real, permanent, and verifiable.

This mitigation measure may not be feasible, based on costs, logistics, or other factors. Regarding logistics, whether the District could develop a new on-site or off-site mitigation program to effectively reduce emissions to less-than-significant levels in a timely manner is uncertain.

Mitigation Measures: GCC-1B: GHG Emissions Offsets

As an alternative to Mitigation Measure GCC-1A, or if SCVWD does not have sufficient GHG credits, SCVWD may purchase additional GHG emissions credits. The total credits will be equal to the average emissions above the threshold over the lifetime of the SMP Update, or 30,402 metric tons, as adjusted based on the emissions reductions achieved by Mitigation Measure AIR-1A.

For purchased credits, SCVWD will open a Climate Action reserve account or engage a private broker to facilitate the purchase of carbon offset credits from a voluntary market. Carbon offset credits purchased by SCVWD will be banked by the Climate Action Reserve, so that carbon offset credits purchased are real, permanent, and verifiable. Carbon offset credits will be measured in metric tons of CO_2e. Documentation of existing and/or purchased GHG offsets will be provided to the BAAQMD.

This mitigation measure may not be feasible, based on costs or other factors.

Chapter 3.6

HAZARDS AND HAZARDOUS MATERIALS

3.6 Hazards and Hazardous Materials

3.6.1 Introduction

This section presents the regulatory setting, environmental setting, and potential impacts of the Proposed Project related to hazards and hazardous materials. Proposed Project activities may involve the use of hazardous materials (such as those used for maintenance equipment), could involve work within areas of existing contamination, or could have impacts related to other types of hazards such as wildfires, mosquitoes, emergency response, and pesticide use. Data resources used in the preparation of this section included the California Department of Forestry and Fire Protection's fire hazard maps, the State Water Resources Control Board's (SWRCB) Geotracker, and the California Department of Toxic Substances Control's (DTSC) EnviroStor database.

3.6.2 Regulatory Setting

Numerous laws and regulations govern the use of, or work near, hazardous materials. Other laws and regulations govern other potential hazards. Each relevant law and regulation is described briefly below.

Federal Plans, Policies, Regulations, and Laws

Comprehensive Environmental Response, Compensation, and Liability Act

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA, also called the Superfund Act) (42 U.S. Government Code [USC] Sec. 9601 et seq.) is intended to protect the public and the environment from the effects of past hazardous waste disposal activities and new hazardous material spills. Under CERCLA, the U.S. Environmental Protection Agency (USEPA) has the authority to seek the parties responsible for hazardous materials releases and to assure their cooperation in site remediation. CERCLA also provides federal funding (the "Superfund") for the remediation of hazardous materials contamination. The Superfund Amendments and Reauthorization Act of 1986 (Public Law 99-499) amends some provisions of CERCLA and provides for a Community Right-to-Know program.

Resource Conservation and Recovery Act

The Resource Conservation and Recovery Act (RCRA) (42 USC Sec. 6901 et seq.) was enacted in 1976 as an amendment to the Solid Waste Disposal Act to address the nationwide generation of municipal and industrial solid waste. RCRA gives USEPA the authority to control the generation, transportation, treatment, storage, and disposal of hazardous waste, including underground storage tanks storing hazardous substances. RCRA also establishes a framework for the management of nonhazardous wastes. RCRA addresses only active and future facilities; it does not address abandoned or historical sites, which are covered by CERCLA (see preceding discussion).

Federal Insecticide, Fungicide, and Rodenticide Act

The Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) (7 USC 136 et seq.) was enacted in 1947. The purpose of FIFRA is to establish federal jurisdiction over the distribution, sale, and use of pesticides. Key provisions of FIFRA require pesticide applicators to pass a licensing examination for status as "qualified applicators," create a review and registration process for new pesticide products, and provide thorough and understandable labeling that includes instructions for safe use.

State Plans, Policies, Regulations, and Laws

California state regulations, which are equal to or more stringent than federal regulations, require those handling hazardous wastes to plan for and manage waste to handle, store, and dispose them properly, to reduce risks to human health and the environment. Several key state laws pertaining to hazardous wastes are discussed next.

Hazardous Waste Control Act

The Hazardous Waste Control Act of 1972 created the state's Hazardous Waste Management Program, which is similar to but more stringent than the federal program under RCRA. The Hazardous Waste Control Act is implemented at the state-level by regulations contained in Title 26 of the CCR. Regulations in 26 CCR list more than 800 materials that may be hazardous and establish criteria for their identification, packaging, and disposal. Under the Hazardous Waste Control Act and 26 CCR, hazardous waste generators must complete a manifest that accompanies the waste from the generator to the transporter to the ultimate disposal location. Copies of the manifest must be filed with DTSC.

Department of Pesticide Regulation

USEPA has delegated primary authority to the California Department of Pesticide Regulation (CDPR) to enforce federal and state laws pertaining to the proper and safe use of pesticides (CDPR 2009a). However, County Agricultural Commissioners (CAC) and their staffs are largely responsible for the in-field enforcement of CDPR's pesticide use regulations in California's 58 counties. Personnel from CDPR's headquarters and CDPR field staff provide training, coordination, technical, and legal support to the counties (CDPR 2009a).

Title 3-Food and Agriculture, Division 6. Pesticides and Pest Control Operations in the California Code of Regulations describes the role of CDPR and provides guidance related to: pesticide regulatory programs; pesticides (including pesticide registration and the identification and use of restricted materials); licensing, work requirements, and pesticide-related worker safety during pest control operations; and environmental protection for groundwater, air quality, aquatic and marine environments, surface water, and compost (CDPR 2009b). CACs, on behalf of CDPR, are responsible for the in-field enforcement of these various human health and environmental protections from pesticides.

General NPDES Aquatic Pesticide Use Permit

The SWRCB has adopted a general National Pollutant Discharge Elimination System (NPDES) permit (Water Quality Order No. 2004-0009-DWQ, General Permit No. CAG990005) for the regulation of aquatic pesticides to control aquatic weeds in waters of the United States (SWRCB 2006). "Waters of the United States" includes all waters currently used, used in the past, or susceptible to use in interstate commerce; all interstate waters; all other waters the use, degradation, or destruction of which would or could affect interstate or foreign commerce; impoundments of and tributaries to waters of the United States and wetlands adjacent to waters of the United States; and flood protection channels that exchange water with waters of the United States (SWRCB 2006). This General NPDES permit only authorizes the discharge of the following aquatic pesticides: 2,4-D, acrolein, copper, diquat, endothall, fluridone, glyphosate, imazapyr, sodium carbonate peroxyhydrate, and triclopyr-based aquatic pesticides. Aquatic pesticides that are applied to waters of the United States in accordance with FIFRA label requirements are not considered pollutants. However, pesticides or by-products that persist in or leave the treatment area after a specified treatment period are considered pollutants and require coverage under this General Permit.

To obtain coverage under the General NPDES permit, a discharger must comply with all of the monitoring, reporting, and other restrictions detailed in the permit. First, an applicant must submit a Notice of Intent, a vicinity map, and an annual fee to the applicable Regional Water Quality Control Board (RWQCB) to apply for coverage under the permit. An applicant must comply with the specific monitoring requirements identified in the permit and must submit annual reports (at the least) to the applicable RWQCB. The General NPDES permit for weed control requires that dischargers comply with effluent limitations, including developing and implementing an Aquatic Pesticide Application Plan, and complying with applicable receiving water limitations (SWRCB 2006). A discharger covered by the permit must follow all pesticide label instructions and any terms contained in Use Permits issued by CACs. In addition, applicators of a pesticide designated as a restricted material must either be licensed by CDPR or must work under the supervision of a licensed professional (SWRCB 2006). All aquatic pesticides applied by SCVWD under the General NPDES permit are done so in accordance with the permit requirements.

Emergency Services Act

Under the Emergency Services Act, the State of California developed an emergency response plan to coordinate emergency services provided by federal, state, and local agencies. Rapid response to incidents involving hazardous materials or hazardous waste is an important part of the plan, which is administered by the California Office of Emergency Services. This office coordinates the responses of other agencies, including USEPA, the California Highway Patrol, the nine RWQCBs, the various air quality management districts, and county disaster response offices.

California Occupational Safety and Health Administration Standards

Title 8 of the California Occupational Safety and Health Administration (Cal/OSHA) regulations specifies that workers who may be exposed to contaminated soils, vapors that could be inhaled, or possibly groundwater containing hazardous levels of constituents, be

subject to monitoring and personal safety equipment requirements that specifically address airborne contaminants. The primary intent of the Title 8 requirements is to protect worker health.

Regional and Local Plans, Policies, Regulations, and Ordinances

Some local agencies also have regulations related to hazards and hazardous materials.

Santa Clara County Agricultural Commissioner

The Santa Clara CAC directs the enforcement programs of the Santa Clara County Division of Agriculture. One of the enforcement programs regulates the use, storage, and disposal of all pesticides used in Santa Clara County (County of Santa Clara 2010a). The CAC investigates pesticide-related illnesses and complaints, strictly enforces regulations protecting workers who handle pesticides, samples produce for pesticide residues, and oversees all pesticide applications made to any crop in Santa Clara County. For SMP-related activities, the CAC requires that (County of Santa Clara 2010a):

- all employees that handle pesticides complete written training on specific topics listed in Title 3 California Code of Regulations, Section 6724 on an annual basis;
- all pest control companies that apply pesticides for hire must file a monthly use report with each county in which they perform work;
- all pest control advisors, pilots, and pest control businesses performing work in Santa Clara County must register with the CAC office before performing work; and
- a restricted materials permit or an operator number must be received from the CAC office before the use of pesticides on crops or by any professional pest control company.

SCVWD is considered equivalent to a pest control company for the purposes of the CAC regulation and submits monthly reports to the CAC as part of their SCVWD-wide vegetation management program. The application of pesticides as part of the SMP is included in these monthly reports.

Santa Clara County Burn Permit and Other Local Authorizations

The Santa Clara County Office of the Fire Marshal is responsible for fire prevention activities in unincorporated areas of the county. One of its duties is to regulate controlled burns on properties within the Santa Clara County Wildland Urban Interface Fire Area. The primary purpose of a burn permit is to assure that burning operations are conducted safely. Burn permits are issued for the purpose of disposing waste vegetation for agricultural waste, pest or disease control, and for defensible space clearance. The County Fire Marshal prohibits all other open burning. The permitted burn season is generally between November and May. For properties not located within the County Fire Marshal's jurisdiction, controlled burns are handled by local fire departments (County of Santa Clara Office of the Fire Marshal 2010).

3.6.3 Environmental Setting

This section presents an overview of hazards in the Project Area, including: (1) the potential types and locations of existing hazardous materials contamination in the county; (2) transportation routes, emergency response, and related considerations for routing of SMP Update vehicles; and (3) other types of hazards that could affect or be affected by the SMP Update, such as wildland fires and mosquito infestation.

Hazardous Waste Generating Sites

Numerous hazardous materials are found in Santa Clara County. During fiscal years (FY) 2008–2009 (July 2008 through June 2009), hazardous waste was produced from 3,693 generators throughout the county, excluding generators located in Gilroy, Santa Clara, and Sunnyvale that were regulated by each of those cities (Baker, pers. comm., 2010). Of this total number of generators, 112 were large RCRA-quantity generators or generators of large quantities of federally-regulated hazardous waste (Baker, pers. comm., 2010). Generally, the number of hazardous waste generators has increased over time though the types of generators have changed from primarily manufacturing industries to primarily service-type businesses and industries (e.g. dry cleaners, auto repairs) (Baker, pers. comm., 2010). Business and industrial generators include automotive and transportation industries, which store and use petroleum fuels, chlorinated solvents, and paints for repairs; manufacturing industries that use solvents, paints, metals, compressed gases, and cleaning agents; and the agricultural industry, which uses pesticides and fertilizers.

Maintenance activities proposed under the SMP Update would involve the handling and application of pesticides and hazardous materials associated with automobiles and other motorized equipment (petroleum fuels and lubricants). However, in compliance with Title 8 of the Cal/OSHA regulations, all maintenance workers would be subject to monitoring and personal safety equipment requirements. Adhering to these regulations would also reduce potential hazards to non-construction workers and Project Area occupants because of required site monitoring and reporting, and other required controls. Proposed Project workers who were in direct contact with soil or groundwater that contained hazardous levels of constituents would perform all activities in accordance with a site-specific hazardous operations health and safety plan, as outlined in Cal/OSHA standards.

Emergency Response

Hazardous materials emergency response is the responsibility of the Santa Clara County Department of Environmental Health (DEH), with the assistance of five participating agencies. In addition, hazardous materials emergency response also is provided by the City of Gilroy's Department of Building, Life, and Environmental Safety; Santa Clara City Fire Department; and the City of Sunnyvale's Department of Public Safety Fire Services Bureau; within their respective jurisdictions. Five participating agencies (the Santa Clara County, Milpitas, San Jose, Mountain View, and Palo Alto fire departments) assist and coordinate their activities with the Santa Clara County DEH (Unidocs 2009). These hazardous materials response teams are trained to respond to any level of hazardous materials incident in the county including overturned tank trucks, fires involving hazardous materials and chemicals, incidents involving radioactive materials, downed electrical lines and ruptured natural gas

lines, chlorine and toxic gas releases, fuel spills, and explosives and bombs. The SCVWD coordinates with emergency response providers, as needed, during its routine maintenance activities. Furthermore, the SCVWD has its own HAZMAT Team that responds to numerous types of hazardous emergencies and/or clean-ups.

Transportation Routes

SCVWD transports its hazardous wastes through the county by truck, primarily along major arterials and highways, for disposal at treatment, storage, and disposal facilities in other counties or outside of California. County roads and city streets may be used to transport hazardous wastes from their sources to major highways. Haulers are required to use the most direct, safe route.

Contaminated Sites and Brownfields

Brownfields are properties that have a potential for redevelopment or reuse but, because of actual or suspected contamination, are vacant. Former auto-wrecking yards, gas stations, computer-electronics industry sites with chlorinated solvent discharges, and lumber mills are examples of Brownfields found in Santa Clara County. The SWRCB and its nine RWQCBs regulate Brownfield sites.

According to the SWRCB's GeoTracker database (SWRCB 2010), 3,707 known sites located in Santa Clara County have been contaminated with hazardous waste. Of these, 2,420 sites have been remediated and are considered closed. The remaining 1,287 sites are open (i.e., still active) and either being remediated or remain in need of remediation. Remediated sites could contribute to legacy sources of contamination at SMP Update maintenance reaches; similarly, active sites have the potential to result in active sources of contamination at proposed maintenance locations.

Underground Storage Tanks and Other Hazardous Spills

Underground storage tanks are common throughout Santa Clara County. They are most often used for the storage of gasoline and diesel fuels, while also used for the storage of new and used motor oil, solvents, and chemicals. Leaking underground fuel tanks (LUFTs), mainly those containing petroleum, are the leading cause of soil and groundwater contamination in the county. LUFTs primarily occur in the urbanized areas of the county. Contaminated sites are tracked in the SWRCB's GeoTracker database. According to GeoTracker, 323 open LUFT sites are in Santa Clara County (SWRCB 2010). A total 2,304 closed or remediated LUFT sites exist in Santa Clara County. LUFTs have the potential to cause contamination at SMP Update maintenance locations, in a similar manner as those described above under *Contaminated Sites and Brownfields*.

Maintenance activities associated with the Proposed Project would vary in location and extent from year to year. In addition, the location and extent of contamination sites would vary from year to year, as old sites were cleaned up and new sites were identified. Current locations of contaminated sites are contained in the Geotracker database. All those within 1,500 feet of a stream that could potentially be maintained under the Proposed Project are shown on Figure 3.6-1.

Hazardous Waste Disposal Sites

Although some hazardous waste facilities collect household hazardous waste in Santa Clara County, no certified hazardous waste disposal facilities exist in the county that can accept and dispose contaminated sediments (DTSC 2007a). Thus, contaminated sediments would need to be disposed at hazardous waste landfills outside of the county. Three hazardous waste disposal sites are located in California: the Chemical Waste Management Inc. Kettleman Hills facility (Kettleman Hills); the Clean Harbors Buttonwillow facility (Buttonwillow); and the Clean Harbors Westmorland facilities (Westmorland). These facilities are capable of treating, storing, and/or disposing virtually all solid, semi-solid, and liquid hazardous, extremely hazardous, and non-hazardous wastes, including contaminated sediments (DTSC 2007b, 2008, 2010).

The Kettleman Hills hazardous landfill (B-18) has a capacity of approximately 10.7 million cubic yards (DTSC 2010) but can only accept very small quantities of hazardous waste (Brady, pers. comm., 2011) because it has nearly reached capacity. Buttonwillow, located west of Bakersfield, is a fully permitted hazardous waste facility that is permitted to receive, store, treat and landfill a variety of hazardous and non-hazardous waste streams (Clean Harbors 2010a). The permitted capacity of the Buttonwillow landfill is 13,325,000 cubic yards, and the current constructed landfill capacity is 950,000 cubic yards (Clean Harbors 2010a, DTSC 2008). That facility is capable of accepting large quantities of waste, including the amounts potentially to be generated by the Proposed Project (Winwood, pers. comm., 2011). The Westmorland facility, located near the Salton Sea, has a design capacity of 5 million cubic yards (Clean Harbors 2010b). Disposal at any of these facilities would be dependent on the characteristics of material to be disposed, the available capacity at the facility, and the transportation distance. Sediment classified as hazardous that is excavated as part of SMP Update activities would likely be disposed at Buttonwillow because it has sufficient capacity and is the second closest facility (after Kettleman Hills) to Santa Clara County.

Wildland Fire Hazards

The primary fire season in the Project Area extends from late summer through fall, when conditions are driest and air temperatures are high. Fire hazards in Santa Clara County are influenced by topography and wind patterns. The terrain of the Santa Clara Valley results in prevailing winds that flow roughly parallel to the Valley's northwest-southeast axis. According to the Wildland Fire Threat Area maps produced by the California Department of Forestry and Fire Protection (Figures 3.6-2 and 3.6-3), the wildfire threat is most extreme at the highest elevations, while the fire threat is the least in the lowest elevations of the county (California Department of Forestry and Fire Protection 2007). The State of California has responsibility for the control of wildland fire hazards in the Diablo Range and the Santa Cruz Mountains of the county (Figure 3.6-2), while the local responsibility areas (LRAs) are located in the lower elevation and more urbanized areas (Figure 3.6-3). The Santa Clara County Office of the Fire Marshal manages fire hazards in unincorporated areas of the county. Their Wildland Urban Interface Area maps, based on the Department of Forestry and Fire Protection maps, identify unincorporated county areas prone to wildland fires.

In the Project Area, very high fire hazard areas in LRAs occur east of the municipalities of Saratoga, Los Gatos, and Morgan Hill, and in a few unincorporated areas of the county (Figure 3.6-3). As shown in Figures 3.6-2 and 3.6-3, upper tributaries of Stevens, Los Gatos, Llagas, and Uvas creeks are within high and very high fire hazard areas. An emerging cause for concern would be fires started by mowing and use of power equipment (such as those used under the existing SMP) around very dry vegetation.

The County Fire Marshal would regulate flaming activities undertaken by SCVWD as part of the Proposed Project, in all of the cities within the Project Area except for the cities of Gilroy, Milpitas, Mountain View, Palo Alto, San Jose, Santa Clara, and Sunnyvale. Before undertaking any flaming activities, SCVWD would obtain a permit and/or authorization from the County Fire Marshal and the fire marshals of the seven cities listed above that provide their own fire protection. As part of the permit and authorization process, SCVWD would provide details on the type of flaming device, proposed flaming locations, the timing of any flaming activities, and the fire prevention measures that would be implemented.

Pesticide Use by the Santa Clara Valley Water District

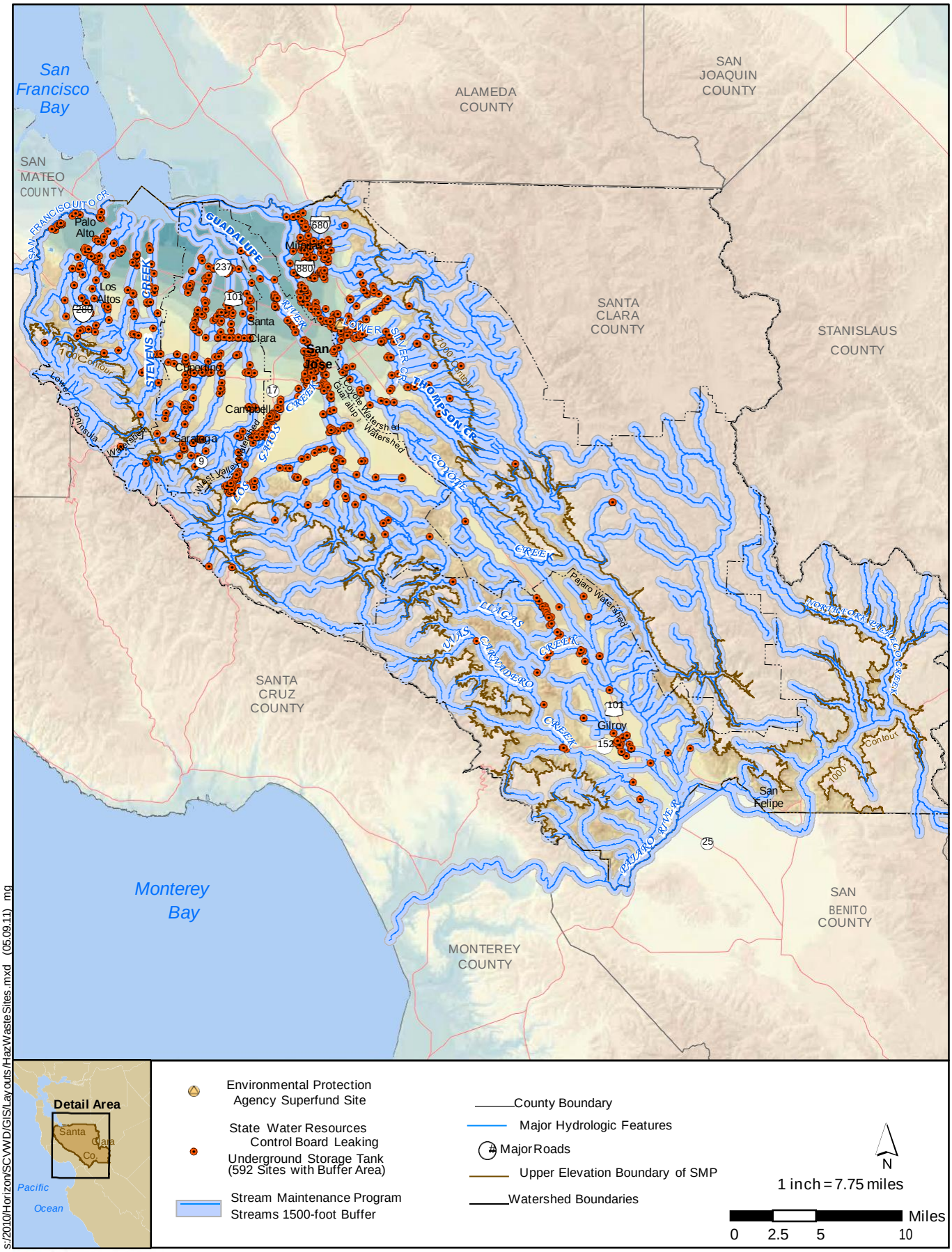
As part of its implementation of the existing SMP, one method SCVWD has used to control vegetation along maintained creeks has been the application of pesticides. SCVWD has applied pesticides in accordance with the current SMP Manual, and with federal and state regulations and permits. Pesticide use is reported monthly to the CAC. During FY 2007–2009[1], the most recent years for which data is available, pesticides were applied to the Guadalupe River and Adobe, Alamitos, Barron, Berryessa, Calabazas, Canoas, Coyote, Hale, Heney, Llagas, Los Gatos, Matadero, Penitencia, Regnart, Rodeo, San Francisquito, Saratoga, Stevens, and Uvas creeks. Table 3.6-1 shows the various types of pesticides applied under the existing SMP and the type of vegetation targeted by that pesticide. Table 3.6-2 lists the types and quantities of pesticides applied under the existing SMP during FY 2007–2009.

Mosquito Abatement

The Santa Clara County Vector Control District (SCCVCD) manages vector control in Santa Clara County. The SCCVCD manages vectors such as rats, arthropods, mosquitoes, ticks, and yellow jackets, to control the spread of vector-borne diseases including West Nile virus, Lyme disease, rabies, and plague (SCCVCD 2010). The SCCVCD uses a variety of methods to control vectors, including stocking ponded areas with mosquito fish and the application of insecticides. Larval and adult mosquito surveys are conducted to monitor the spread of vector-borne diseases.

Under the California Health and Safety Code, mosquito abatement districts are empowered to take all necessary and proper steps for the elimination and extermination of mosquitoes. SCCVCD personnel make routine inspections of mosquito sources, such as ditches, channels, lagoons, drain lines, marsh areas, creeks, lakes, flood protection basins, utility vaults, catch basins, and fish ponds. If mosquito production is found, they take action to control or eliminate the problem.

[1] The District's fiscal year extends from July 1 through June 30.



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Horizon WATER and ENVIRONMENT

Figure 3.6-1: Known Hazardous Sites in Project Area

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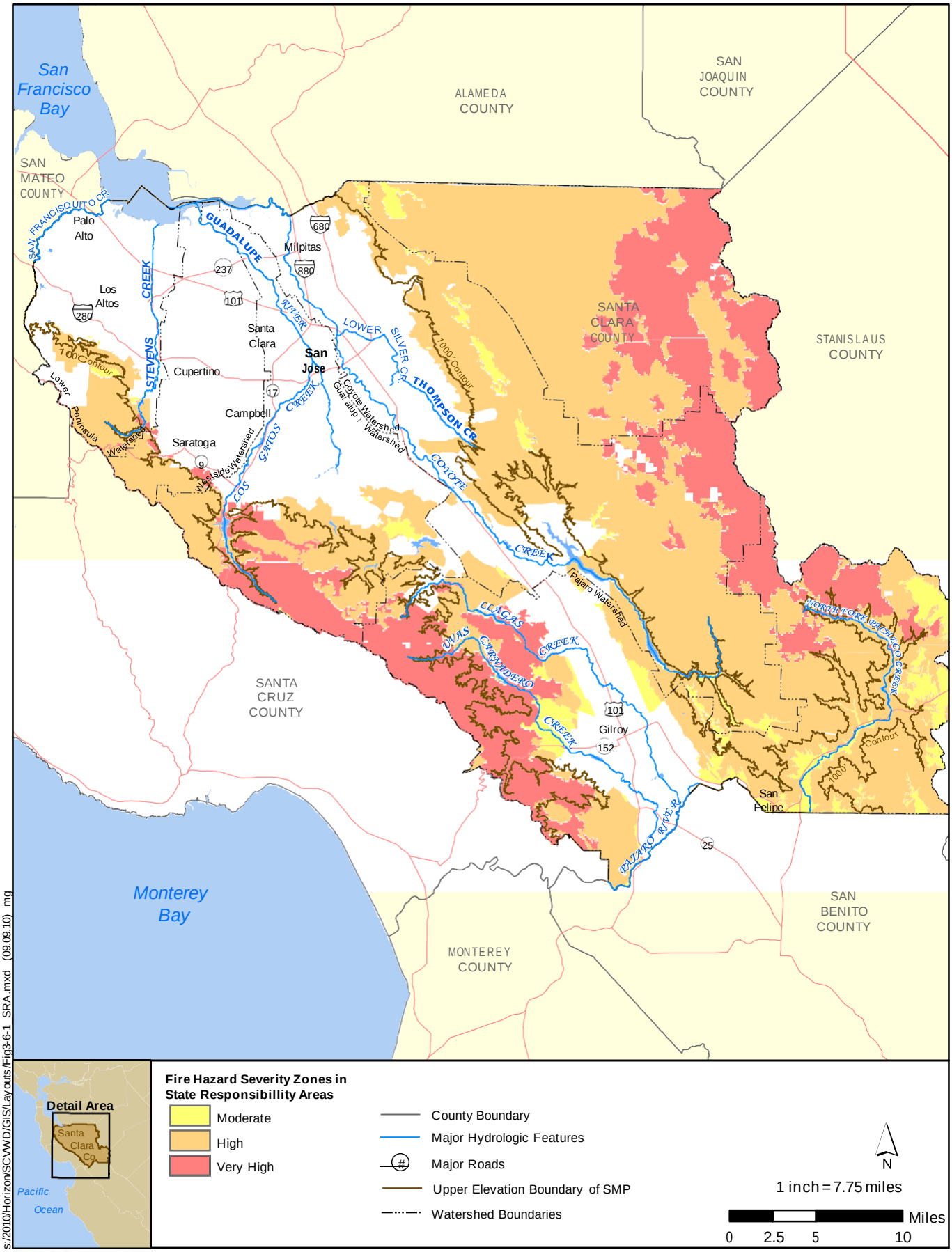

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Horizon WATER and ENVIRONMENT

Figure 3.6-2: Fire Hazard Severity Zones in State Responsibility Areas

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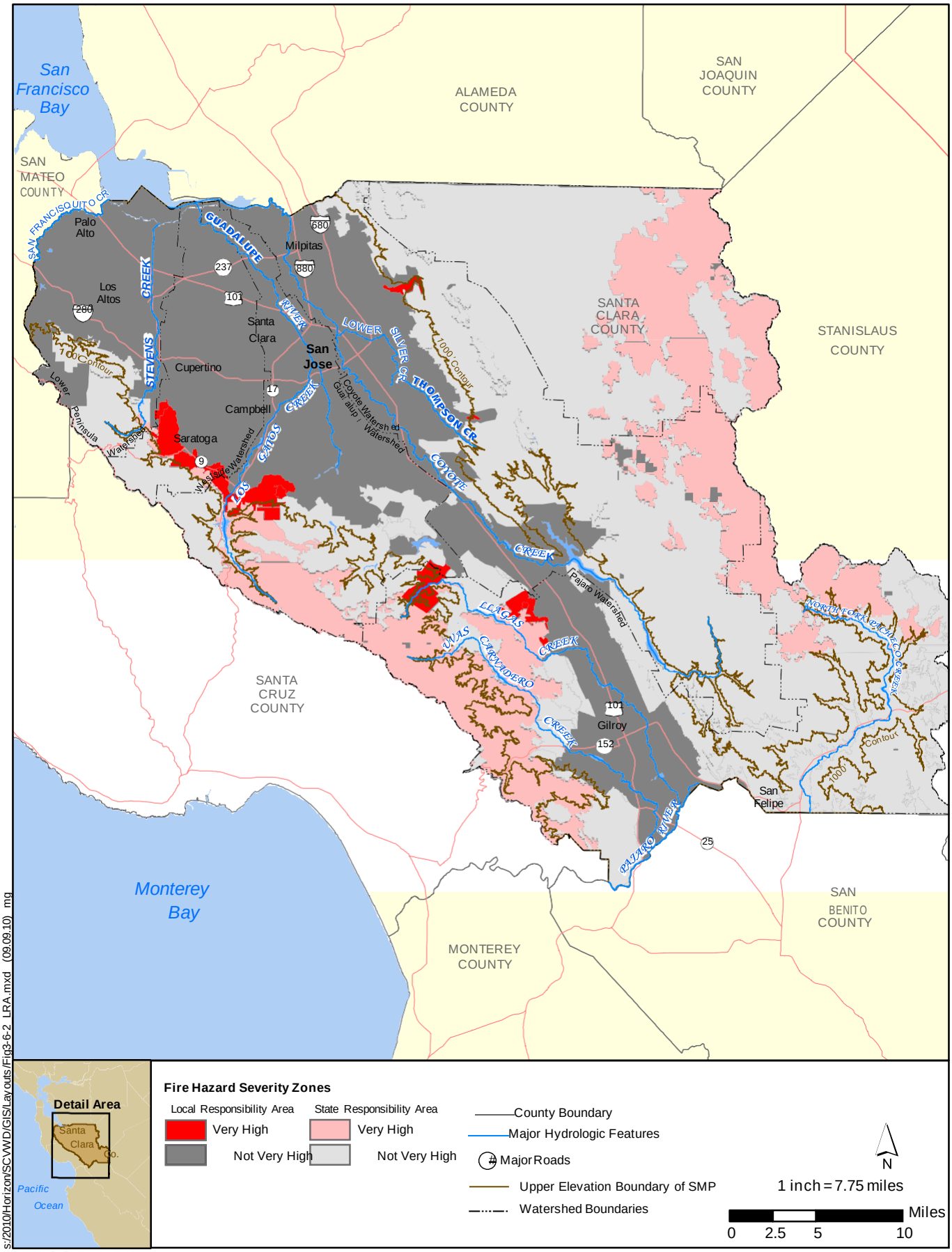

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Horizon WATER and ENVIRONMENT

Figure 3.6-3: Fire Hazard Severity Zones in Local Responsibility Areas

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Table 3.6-1. Pesticide Types Applied under the Current SMP

Active Chemical Ingredient	Manufacturer Trade Name	Pesticide Type	Target
Glyphosate	Accord XRT	Post-emergent herbicide	Non-selective
Glyphosate	Aquamaster	Post-emergent herbicide	Non-selective
Glyphosate	Roundup Pro	Post-emergent herbicide	Non-selective
Glyphosate	Roundup Pro-Concentrate	Post-emergent herbicide	Non-selective
Imazapyr	Habitat	Post-emergent herbicide	Aquatic
Isoxaben	Gallery	Pre-emergent herbicide	Broadleaf
Pendimethalin	Pendulum	Pre-emergent herbicide	Grasses/weeds
Pendimethalin	Pendulum Aquacap	Post-emergent herbicide	Non-selective Broadleaf/grasses
Oryzalin	Surflan A.S.	Pre-emergent herbicide	Non-selective Broadleaf/grasses
Triclopyr	Garlon 4	Post-emergent herbicide	Broadleaf
N/A	Surfactants	N/A	N/A
N/A	Agridex	Surfactant	N/A
Dialkyl Polyoxyethylene Glycol	Competitor	Surfactant	N/A
N/A	Dyes	N/A	N/A

N/A – not available
Source: SCVWD 2010a

Table 3.6-2. Pesticides Applied under the Current SMP (FY 2007–2009)

Active Chemical Ingredient	Manufacturer Trade Name	FY 2007 Quantity Applied (gallons)	FY 2008 Quantity Applied (gallons)	FY 2009 Quantity Applied (gallons)
Glyphosate	Accord XRT	3.25	0.04	0
Glyphosate	Aquamaster	421.94	328.01	321.22
Glyphosate	Roundup Pro	253.35	17.75	0
Glyphosate	Roundup Pro-Concentrate	356.26	571.37	617.82
Imazapyr	Habitat	0	0	0.01
Isoxaben	Gallery	803.95[1]	687.00[1]	813.36[1]
Pendimethalin	Pendulum	58.00	0	0
Pendimethalin	Pendulum Aquacap	437.90	551.9	737.59
Oryzalin	Surflan A.S.	60.45	0	0
Triclopyr	Garlon 4	0.07	0.01	3.06
N/A	Surfactants	84.09	62.68	1.46
N/A	Agridex (surfactant)	0	0	0.47
Dialkyl Polyo-xyethylene Glycol	Competitor (surfactant)	0.26	31.98	93.89
N/A	Dyes	21.76	9.77	16.17

Notes:
FY – fiscal year; N/A – not available
[1] Quantities of this chemical are provided in pounds instead of gallons.
Source: SCVWD 2010b

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3.6.4 Impact Analysis

Methodology

Impacts of the Proposed Project were evaluated qualitatively, based on the potential for relevant activities to create a significant hazard to the public or environment during or after their implementation.

Criteria for Determining Significance

For the purposes of this analysis, the Proposed Project would result in a significant impact from hazards and hazardous materials if it would:

A. create a significant hazard to the public or environment through the routine transport, use, or disposal of hazardous materials or through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment;

B. emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school;

C. create a significant hazard to the public or the environment from existing hazardous materials contamination on site or nearby;

D. for a project located within two miles of an airport or in the vicinity of a private airstrip, would the project result in a substantial safety hazard for people residing or working in the project area or to aircraft utilizing the airport;

E. impair implementation of an adopted emergency response plan; or

F. expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands.

Although Proposed Project activities may be performed within 2 miles of an airport, these activities would not interfere with airport operations, would not involve the use of any equipment that would affect aircraft utilizing any airports in the Project Area, and would not result in a substantial safety hazard to people residing or working in vicinity of airports. For these reasons, this issue is not discussed further in the DSEIR.

The Proposed Project maintenance activities would not create standing water that would foster mosquitoes nor would it interfere with abatement efforts conducted by the SCCVCD, so this issue is not discussed further in the DSEIR.

Environmental Impacts

Impact HAZ-1: Use, Transport, or Accidental Release of Hazardous Materials such that a Significant Hazard to the Public or Environment Would Result (Significance Criterion A; Less than Significant)

Proposed maintenance activities would be temporary in any one location, and generally confined to a small area surrounding creek channels, canals, or sediment reuse/disposal sites. Maintenance activities would be located in or near public areas where residents or recreational users could be exposed to hazardous materials and/or channels or canals that could sequester or transport chemicals in the water and sediment. In addition, the transport of these materials to the maintenance sites could potentially expose the public or the environment to hazardous materials. If hazardous materials were accidentally released during use or transport, a significant impact on humans or the environment could result. Additional details regarding the potential use of hazardous materials for each proposed SMP Update activity are provided below.

Sediment Removal and Bank Stabilization

Sediment removal and bank stabilization activities would require the use of fuels and lubricants for maintenance equipment. These hazardous materials would be transported to and from maintenance sites and would be removed once projects were completed. Hazardous materials would not be permanently stored at these maintenance sites. If hazardous materials were released into the water or the ground during equipment refueling or maintenance activities, contamination and harm to people or wildlife could result.

Vegetation Management

The Proposed Project's vegetation management activities would include the use of fuels and lubricants, similar to the sediment removal and bank stabilization activities described above. In addition, these activities would include the application of herbicides, including instream and bank bench areas. The use, transport, or accidental spills of these hazardous materials could adversely affect people or wildlife if the pollutants were released into the water or the ground.

Management of Animal Conflicts

Animal conflict management activities related to the Proposed Project would include lethal control methods involving the use of fumigants or placement of bait traps that would contain rodenticides. In particular, phosphine gas could be produced if water were to come in contact with Zinc Phosphide. These activities could present risk to humans or the environment if the rodenticides were accidentally ingested or inhaled by humans, or transported to local water bodies (impacts to wildlife are discussed in Chapter 3.3, *Biological Resources*).

Minor Maintenance/Canal Maintenance

Minor maintenance would potentially involve the use of hazardous materials during the use of heavy equipment for grading or sediment removal. Potential types of hazardous materials associated with minor maintenance would be similar to those described

previously for sediment removal and bank stabilization activities. Because routine canal maintenance activities include all general work activities, effects would be the same as described above for other routine maintenance work. In addition, although paint would be used for graffiti removal, it would not be expected to have a substantial adverse effect if handled properly.

Applicable Best Management Practices

The following BMPs would be implemented as part of SMP Update activities. In addition to those listed below, other BMPs (as cited in Section 3.3, *Biological Resources*) would be applicable for the specific protection of biological resources from the use, transport, or accidental release of hazardous materials. Descriptions of each BMP are provided in Chapter 2, *Project Description*.

BMP GEN-2: Instream Herbicide Application Work Window
BMP GEN-19: Work Site Housekeeping
BMP GEN-21: Staging and Stockpiling of Materials
BMP GEN-24: On-Site Hazardous Materials Management
BMP GEN-25: Existing Hazardous Materials
BMP GEN-26: Spill Prevention and Response
BMP GEN-30: Vehicle and Equipment Maintenance
BMP GEN-31: Vehicle Cleaning
BMP GEN-32: Vehicle and Equipment Fueling
BMP GEN-37: Implement Public Safety Measures
BMP GEN-39: Planning for Pedestrians, Traffic Flow, and Safety Measures
BMP ANI-1: Avoid Redistribution of Rodenticides
BMP HM-4: Posting and Notification for Pesticide Use

Conclusion

Implementation of BMPs would minimize the potential for the Proposed Project to result in a significant hazard to the public or the environment from the use, transport, or accidental release of hazardous materials. Therefore, this impact would be less than significant and no mitigation would be required.

Mitigation Measures: No mitigation is required.

Impact HAZ-2: Potential to Interfere with Emergency Response (Significance Criterion E; Less than Significant)

Temporary road or lane closures, as well as traffic associated with the Proposed Project, could potentially affect emergency response as described below.

Sediment Removal

During sediment removal activities, temporary road or lane closures may be necessary. In addition, traffic would be generated by sediment removal activities (see Section 3.12, *Transportation and Traffic*). Road closures or SMP Update-generated traffic may interfere with emergency response efforts and extend response times.

Other Maintenance Activities

Other Proposed Project activities (bank stabilization, vegetation management, management of animal conflicts, minor maintenance, and canal maintenance) also could potentially require road closures and generate additional traffic. Potential impacts would be similar to those described above for sediment removal.

Applicable Best Management Practices

The following BMPs would be implemented as part of SMP Update activities. Descriptions of each BMP are provided in Chapter 2, *Project Description*.

BMP GEN-36: Public Outreach
BMP GEN-39: Planning for Pedestrians, Traffic Flow, and Safety Measures

Conclusion

Implementation of BMPs would direct Proposed Project-related traffic and temporary lane closures resulting from Proposed Project activities to be coordinated with local emergency response agencies, to help maintain emergency access. Therefore, this impact would be less than significant and no mitigation would be required.

Mitigation Measures: No mitigation is required.

Impact HAZ-3: Be Located on a Known Existing Contaminated Site (Significance Criterion C; Less than Significant)

According to the SWRCB's GeoTracker database (SWRCB 2010), 3,707 known sites located in Santa Clara County have been contaminated with hazardous waste. Of these sites, 1,287 are active and either being remediated or remain in need of remediation. Figure 3.6-1 shows the locations of sites in proximity to SMP channels. The potential of the SMP Update activities to affect known contaminated sites is discussed further below.

Sediment Removal

Sediment removal activities could potentially disturb known existing contaminated sites. As discussed previously, the locations and extent of maintenance activities, including sediment removal activities, changes each year. The potential to disturb existing contaminated sites in the Project Area would be evaluated as part of the annual maintenance planning process.

In addition to the contaminated sites identified by the GeoTracker database, portions of the Guadalupe River watershed within the Project Area are affected by historic mercury mining activities. Soil and groundwater in some areas of this watershed contain hazardous levels of mercury contamination. Proposed maintenance activities involving ground disturbance, such as sediment removal and bank stabilization, may expose the mercury and potentially release it into the environment.

Other Maintenance Activities

All other SMP Update activities may involve some level of ground disturbance and the potential to disturb existing contaminated sites. Management of animal conflicts may

involve physical alterations of habitat, including surface compaction of levee faces or reconstruction of levee side slopes. Vegetation management activities would include discing of areas. Bank stabilization activities could disturb soils during the construction of new temporary access routes or during stabilization activities. Minor maintenance activities could include grading or sediment removal activities. Because routine canal maintenance activities would include all general work activities, effects would be the same as described above for other routine maintenance work. Potential effects of these ground disturbances would be similar to those described above for sediment removal activities.

Applicable Best Management Practices

The following BMPs would be implemented as part of SMP Update activities. Descriptions of each BMP are provided in Chapter 2, *Project Description*.

BMP GEN-3: Avoid Exposing Soils with High Mercury Levels
BMP GEN-4: Minimize the Area of Disturbance
BMP GEN-23: Stream Access
BMP GEN-27: Existing Hazardous Sites

Conclusion

Implementation of BMPs to properly handle and remediate contaminated soils from Proposed Project maintenance activities, would prevent any planned maintenance activities (including sediment disposal or reuse) from disturbing known active contamination or remediation efforts. Through implementation of BMP GEN-3, activities in the Guadalupe River watershed would also avoid or minimize the potential for disturbance to existing mercury contamination. Therefore, this impact would be less than significant and no mitigation would be required.

Mitigation Measures: No mitigation is required.

Impact HAZ-4: Be Located on a Previously Undiscovered Contaminated Site (Significance Criterion C; Less than Significant)

Creeks and canals are common locations for illegal dumping of trash containing hazardous wastes, such as tires, oil filters, and paint cans. In addition, pollutants transported in stormwater runoff can accumulate in these water bodies. The potential for Proposed Project activities to be located on a previously undiscovered contaminated site is discussed further below.

Bank Stabilization and Sediment Removal

In conducting bank stabilization and sediment removal activities, workers could encounter illegally dumped trash, and ground excavation activities could disturb previously unknown buried contamination.

Contaminants also are transported from streets and paved urban areas through storm drains and into stream channels. Areas surrounding storm drain culvert outfalls can accumulate urban contaminants, such as heavy metals and petroleum byproducts from automobiles. Excessive erosion and bank instability could occur near culvert outfalls,

resulting in the need for bank repairs under the Proposed Project. As part of these activities, contaminated locations could be encountered and disturbed.

Other Maintenance Activities

All other SMP Update activities (vegetation management, management of animal conflicts, minor maintenance, and canal maintenance) could involve some level of ground disturbance and have the potential to disturb undiscovered contaminated sites. Effects of ground disturbance during these activities would be similar to those described above for bank stabilization and sediment removal activities.

Applicable Best Management Practices

The following BMPs would be implemented as part of SMP Update activities. Descriptions of each BMP are provided in Chapter 2, *Project Description*.

BMP GEN-3: Avoid Exposing Soils with High Mercury Levels
BMP GEN-4: Minimize the Area of Disturbance
BMP GEN-23: Stream Access
BMP GEN-25: Existing Hazardous Materials
BMP GEN-26: Spill Prevention and Response

Conclusion

By implementing these BMPs, if potential contaminants were found during Proposed Project activities, the area would be treated as if a hazardous spill had occurred, and any ground-disturbing activities, including disturbance of previously undiscovered contamination, would be handled in a manner that would protect both worker health and the environment. Therefore, this impact would be less than significant and no mitigation would be required.

Mitigation Measures: No mitigation is required.

Impact HAZ-5: Create Safety Hazards or Releases of Hazardous Materials in Proximity to a School (Significance Criterion B; Less than Significant)

A total of 398 public schools are located in Santa Clara County (Santa Clara County Office of Education 2010), of which 252 are located within one-quarter mile of a facility that potentially would be subject to maintenance under the Proposed Project (Table 3.6-3, Figure 3.6-4). Most of these schools are in session during a traditional school calendar, and some are open year-round. Thus, children may be present when SMP Update activities are implemented near schools and could potentially be exposed to hazardous materials from Proposed Project work sites.

Sediment Removal and Bank Stabilization

Potential hazardous materials used as part of sediment removal and bank stabilization activities, to be implemented near schools, would include fuels and oils associated with the use of heavy equipment. Improper storage or use of these materials could pose a risk to children, if accidental releases occurred in proximity to schools where children could be present.

Table 3.6-3. Schools within One-Quarter Mile of the Project Area

School	Street	City	State	Zip
Hazelwood Elementary	775 Waldo Rd	Campbell	CA	95008
Montessori Academy	177 E Rincon Ave	Campbell	CA	95008
Rosemary Elementary	401 W Hamilton Ave	Campbell	CA	95008
St. Lucy	76 E Kennedy Ave	Campbell	CA	95008
Village School	775 Waldo Rd	Campbell	CA	95008
West Valley SDA	95 Dot Ave	Campbell	CA	95008
Westmont High	4805 Westmont Ave	Campbell	CA	95008
Bethel Lutheran	10181 Finch Ave	Cupertino	CA	95014
Cupertino High	10100 Finch Ave	Cupertino	CA	95014
Eaton (C.B.) Elementary	20220 Suisun Dr	Cupertino	CA	95014
Garden Gate Elementary	10500 Ann Arbor Ave	Cupertino	CA	95014
Great Success	10505 Miller Ave	Cupertino	CA	95014
Homestead High	21370 Homestead Rd	Cupertino	CA	95014
Monta Vista High	21840 McClellan Rd	Cupertino	CA	95014
Montebello Elementary	15101 Montebello Rd	Cupertino	CA	95014
Regnart Elementary	1170 Yorkshire Dr	Cupertino	CA	95014
Stevens Creek Elementary	10300 Ainsworth Dr	Cupertino	CA	95014
Del Buono (Antonio) Elementary	9300 Wren Ave	Gilroy	CA	95020
Eliot Elementary	470 Seventh St	Gilroy	CA	95020
Gilroy Adult Education	385 IOOF Ave	Gilroy	CA	95020
Gilroy Community Day	275 IOOF Ave	Gilroy	CA	95020
Gilroy High	750 W 10th St	Gilroy	CA	95020
Glen View Elementary	600 Eighth St	Gilroy	CA	95020
Kelley Rod Elementary	8755 Kern Ave	Gilroy	CA	95020
Mt. Madonna High (Cont.)	8750 Hirasaki Ct	Gilroy	CA	95020
San Ysidro Elementary	2220 Pacheco Pass Hwy	Gilroy	CA	95020
South Valley School of Science and Global Studies	385 IOOF Ave	Gilroy	CA	95020
St. Mary's	7900 Church St	Gilroy	CA	95020
Blach (Georgina P.) Intermediate	1120 Covington Dr	Los Altos	CA	94024
Bullis-Purissima Elementary	25890 Fremont Road	Los Altos	CA	94022
Los Altos Christian	625 Magdalena Ave	Los Altos	CA	94024
Miramonte Elementary	1175 Altamead Dr	Los Altos	CA	94024
Pinewood (Lower)	477 Fremont Ave	Los Altos	CA	94024
Waldorf School of the Peninsula	11311 Mora Dr	Los Altos	CA	94024
Foothill College	12345 S El Monte Rd	Los Altos Hills	CA	94022
Pinewood (Upper)	26800 W Fremont Rd	Los Altos Hills	CA	94022
St. Nicholas	12816 El Monte Ave	Los Altos Hills	CA	94024
Academy of Our Mother	19101 Bear Creek Rd	Los Gatos	CA	95033
Alta Vista Elementary	200 Blossom Valley Dr	Los Gatos	CA	95032
Blossom Hill Elementary	16400 Blossom Hill Rd	Los Gatos	CA	95032
Daves Avenue Elementary	17770 Daves Ave	Los Gatos	CA	95030
Hillbrook Elementary	300 Marchmont Dr	Los Gatos	CA	95032
Lakeside Elementary	19621 Black Rd	Los Gatos	CA	95030
Lexington Elementary	19700 Santa Cruz Hwy	Los Gatos	CA	95030
Los Gatos Academy	220 Bel Gatos Rd	Los Gatos	CA	95032
Los Gatos High	20 High School Court	Los Gatos	CA	95032
Rolling Hills Middle	1585 More Ave	Los Gatos	CA	95030

Table 3.6-3. Schools within One-Quarter Mile of the Project Area

School	Street	City	State	Zip
St. Mary's	30 Lyndon Ave	Los Gatos	CA	95030
Yavneh Day	14855 Oka Rd	Los Gatos	CA	95032
Calaveras Hills Continuation H	1331 E Calaveras Blvd	Milpitas	CA	95035
Curtner Elementary	275 Redwood	Milpitas	CA	95035
Merryhill School	1500 Yosemite Dr	Milpitas	CA	95035
Milpitas Adult	1331 E Calaveras Blvd	Milpitas	CA	95035
Milpitas High	1285 Escuela Pkwy	Milpitas	CA	95035
Milpitas Montessori	1500 Yosemite Dr	Milpitas	CA	95035
Rainbow Bridge Center	1500 Yosemite Dr	Milpitas	CA	95035
Randall (Robert) Elementary	1300 Edsel	Milpitas	CA	95035
Rose (Alexander) Elementary	250 Roswell Dr	Milpitas	CA	95035
Russell (Thomas) Junior High	1500 Escuela Pkwy	Milpitas	CA	95035
Spangler (Anthony) Elementary	140 N Abbott	Milpitas	CA	95035
St. John the Baptist	360 S Abel St	Milpitas	CA	95035
Britton (Lewis H.) Middle	80 W Central Ave	Morgan Hill	CA	95037
Carden Academy of Morgan Hill	15700 Monterey Rd	Morgan Hill	CA	95037
Encinal Elementary	9530 N Monterey Rd	Morgan Hill	CA	95037
Machado Elementary	15130 Sycamore Ave	Morgan Hill	CA	95037
Morgan Hill Country	105 John Wilson Way	Morgan Hill	CA	95037
Paradise Valley/Machado Elementary	1400 La Crosse	Morgan Hill	CA	95037
South Valley Christian Elementary	145 Wright Ave	Morgan Hill	CA	95037
St. Catherine	17500 Peak Ave	Morgan Hill	CA	95037
Walsh (P. A.) Elementary	353 W Main Ave	Morgan Hill	CA	95037
Alta Vista High (Cont.)	1299 Bryant Ave	Mountain View	CA	94040
Canyon Heights Academy	310 Easy St	Mountain View	CA	94043
Castro (Mariano) Elementary	505 Escuela Ave	Mountain View	CA	94040
Crittenden Middle	1701 Rock St	Mountain View	CA	94043
German School of Silicon Valley	310 Easy St	Mountain View	CA	94043
Graham (Isaac Newton) Middle	1175 Castro St	Mountain View	CA	94041
Landels (Edith) Elementary	115 Dana St	Mountain View	CA	94041
Monarch Christian	310 Easy St	Mountain View	CA	94043
Mountain View–Whisman Community Day	1701 Rock St	Mountain View	CA	94043
Southbay Christian	1134 Miramonte Ave	Mountain View	CA	94040
Springer Elementary	1120 Rose Ave	Mountain View	CA	94040
St. Francis	1885 Miramonte Ave	Mountain View	CA	94040
St. Joseph	1120 Miramonte Ave	Mountain View	CA	94040
Whisman Community Day	1695 Rock St	Mountain View	CA	94043
Whisman Elementary	310 Easy St	Mountain View	CA	94043
Yew Chung International	310 Easy St	Mountain View	CA	94043
Barron Park Elementary	800 Barron Ave	Palo Alto	CA	94306
Briones (Juana) Elementary	4100 Orme Ave	Palo Alto	CA	94306
Challenger School	3880 Middlefield Rd	Palo Alto	CA	94303
Cubberly Community Center	4000 Middlefield Rd	Palo Alto	CA	94306
Cubberly Community Center & Palo Alto Preparatory	4000 Middlefield Rd	Palo Alto	CA	94306
El Carmelo Elementary	3024 Bryant St	Palo Alto	CA	94306

Table 3.6-3. Schools within One-Quarter Mile of the Project Area

School	Street	City	State	Zip
Emerson	4251 El Camino Real	Palo Alto	CA	94306
Fairmeadow Elementary	500 E Meadow Dr	Palo Alto	CA	94306
Gunn (Henry M.) High	780 Arastradero Rd	Palo Alto	CA	94306
Hoover (Herbert) Elementary	445 E Charleston Rd	Palo Alto	CA	94306
International School of the Peninsula	151 Laura Ln	Palo Alto	CA	94303
International School of the Peninsula	3233 Cowper St	Palo Alto	CA	94306
Keys	2890 Middlefield Rd	Palo Alto	CA	94303
Lady of Rosary	3233 Cowper St	Palo Alto	CA	94306
Mid-Peninsula Jewish Day	4000 Terman Dr	Palo Alto	CA	94306
Palo Verde Elementary	3450 Louis Rd	Palo Alto	CA	94303
Stanford (Jane Lathrop) Middle	480 E Meadow Dr	Palo Alto	CA	94306
Achiever Christian Elementary	820 Ironwood Dr	San Jose	CA	95125
Adult Education (Eastside Union)	625 Educational Park Dr	San Jose	CA	95133
Adult Education Program	625 Educational Park Dr	San Jose	CA	95133
Almaden Country Middle	6835 Trinidad Dr	San Jose	CA	95120
Almaden Preparatory	5670 Camden Ave	San Jose	CA	95124
Almaden Valley Christian	6291 Vegas Dr	San Jose	CA	95120
Apostles Lutheran	5828 Santa Teresa Blvd	San Jose	CA	95123
Archbishop Mitty High	5000 Mitty Ave	San Jose	CA	95129
Baldwin Elementary	280 Martinvale Ln	San Jose	CA	95119
Beacon	5670 Camden Ave	San Jose	CA	95124
Bernal Intermediate	6610 San Ignacio Ave	San Jose	CA	95119
Blackford Elementary	1970 Willow St	San Jose	CA	95125
Blackford High (Alt)	3800 Blackford Ave	San Jose	CA	95117
Blossom Valley Elementary	420 Allegan Cir	San Jose	CA	95123
Boeger (August) Junior High	1944 Flint Ave	San Jose	CA	95148
Broadway High	1088 Broadway Ave	San Jose	CA	95125
Broadway High (Cont.)	4825 Speak Ln	San Jose	CA	95118
Cadwallader Elementary	3799 Cadwallader Rd	San Jose	CA	95121
Calvary Chapel Christian Academy	1175 Hillsdale Ave	San Jose	CA	95118
Canoas Elementary	800 Wren Dr	San Jose	CA	95125
Carolyn Clark	3701 Rue Mirrasou	San Jose	CA	95148
Carson (Rachel) Elementary	4245 Meg Dr	San Jose	CA	95136
Castillero Middle	6384 Leyland Park Dr	San Jose	CA	95120
Cedar Grove Elementary	2702 Sugar Plum Dr	San Jose	CA	95148
Chaboya Middle	3276 Fowler Rd	San Jose	CA	95135
Challenger	19950 McKean Rd	San Jose	CA	95120
Challenger Elementary	880 Wren Dr	San Jose	CA	95125
Cureton (Horace) Elementary	3720 E Hills Dr	San Jose	CA	95127
Darling (Anne) Elementary	333 N 33rd St	San Jose	CA	95133
Dove Hill Elementary	1460 Colt Way	San Jose	CA	95121
East Valley Christian	2715 S White Rd	San Jose	CA	95148
Emmanuel Christian	467 North White Rd	San Jose	CA	95127
Empire Gardens Elementary	1060 E Empire St	San Jose	CA	95112
Evergreen Elementary	3010 Fowler Rd	San Jose	CA	95135
Evergreen Valley College	3095 Yerba Buena Rd	San Jose	CA	95135
Foothill Intermediate	1966 Flint Ave	San Jose	CA	95148
Forest Hill Elementary	4450 McCoy Ave	San Jose	CA	95130

Table 3.6-3. Schools within One-Quarter Mile of the Project Area

School	Street	City	State	Zip
Foundry	258 Sunol St	San Jose	CA	95126
George (Joseph) Middle	277 Mahoney Dr	San Jose	CA	95127
Glider Elementary	511 Cozy Dr	San Jose	CA	95123
Goss (Mildred) Elementary	2475 Van Winkle Ln	San Jose	CA	95116
Graystone Elementary	6982 Shearwater Dr	San Jose	CA	95120
Harte (Bret) Junior High	7050 Bret Harte Dr	San Jose	CA	95120
Holly Oak Elementary	2995 Rossmore Way	San Jose	CA	95148
Holy Spirit School	1200 Redmond Ave	San Jose	CA	95120
Independence High	1776 Educational Park Dr	San Jose	CA	95133
JF Smith	2220 Woodbury Ln	San Jose	CA	95121
Laurelwood Elementary	4280 Partridge Dr	San Jose	CA	95121
Ledesma (Rita) Elementary	1001 Schoolhouse Rd	San Jose	CA	95138
Leigh High	5210 Leigh Ave	San Jose	CA	95124
Leland High	6677 Camden Ave	San Jose	CA	95120
Leland Plus (Cont.)	6677 Camden Ave	San Jose	CA	95120
Ley Va (George V.) Middle	1865 Monrovia Dr	San Jose	CA	95122
Liberty Baptist	2790 S King Rd	San Jose	CA	95122
Little Scholars	3703 Silver Creek Rd	San Jose	CA	95121
Lone Hill Elementary	4949 Harwood Rd	San Jose	CA	95124
Los Gatos Christian	16845 Hicks Rd	San Jose	CA	95120
Lyndale Elementary	13901 Nordyke Dr	San Jose	CA	95127
Lynhaven Elementary	881 S Cypress Ave	San Jose	CA	95117
Majestic Way Elementary	1855 Majestic Way	San Jose	CA	95132
Mathson (Lee) Junior High	2050 Kammerer Ave	San Jose	CA	95116
Matsumoto (Tom) Elementary	4121 Mackin Woods Ln	San Jose	CA	95135
McCollam (Millard) Elementary	3311 Lucian Ave	San Jose	CA	95127
Metropolitan Adult Education-San Jose	1149 E Julian	San Jose	CA	95116
Meyerholz Elementary	6990 Melvin Dr	San Jose	CA	95129
Millbrook Elementary	3200 Millbrook Dr	San Jose	CA	95148
Montessori Academy	495 Massar Ave	San Jose	CA	95116
Morrill Middle	1970 Morrill Ave	San Jose	CA	95132
Mt. Pleasant Elementary	14275 Candler Dr	San Jose	CA	95127
Muir Elementary	6560 Hanover Dr	San Jose	CA	95129
Murdock Elementary School	1188 Wunderlich Dr	San Jose	CA	95129
Noble Elementary	3466 Grossmont Dr	San Jose	CA	95132
Noddin Elementary	1755 Gilda Way	San Jose	CA	95124
Northwood Elementary	2760 Trimble Rd	San Jose	CA	95132
Norwood Creek Elementary	3241 Remington Way	San Jose	CA	95148
Ocala Middle	2800 Ocala Ave	San Jose	CA	95148
Olinder (Selma) Elementary	890 E William	San Jose	CA	95116
Painter (Ben) Elementary	500 Rough and Ready Rd	San Jose	CA	95133
Pegasus High (Cont.)	1776 Educational Park Dr	San Jose	CA	95133
Phoenix High (Cont.)	6150 Snell Rd	San Jose	CA	95123
Piedmont Hills High	1377 Piedmont Rd	San Jose	CA	95132
Piedmont Middle	955 Piedmont Rd	San Jose	CA	95132
Prospect High	18900 Prospect Rd	San Jose	CA	95129
Queen of Apostles Elementary	4950 Mitty Way	San Jose	CA	95129

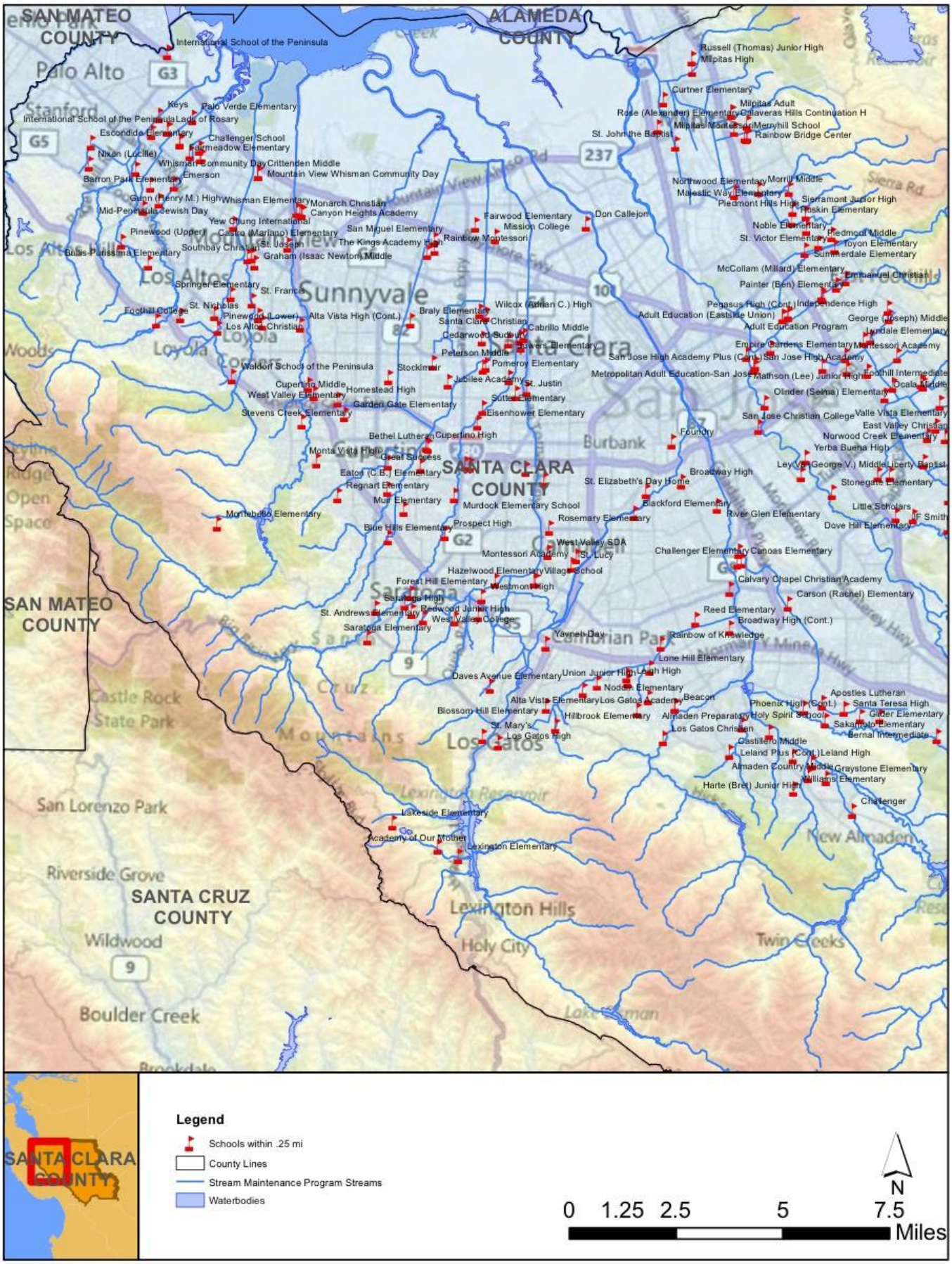
Table 3.6-3. Schools within One-Quarter Mile of the Project Area

School	Street	City	State	Zip
Rainbow of Knowledge	1718 Andover Ln	San Jose	CA	95124
Randol (James) Elementary	762 Sunset Glen Dr	San Jose	CA	95123
Reed Elementary	1524 Jacob Ave	San Jose	CA	95118
River Glen Elementary	1610 Bird Ave	San Jose	CA	95125
Rogers (William) Elementary	2999 Ridgemont Dr	San Jose	CA	95127
Ruskin Elementary	1401 Turlock Ln	San Jose	CA	95132
Ryan (Thomas P.) Elementary	1241 McGinness Ave	San Jose	CA	95127
Sakamoto Elementary	6280 Shadelands Dr	San Jose	CA	95123
San Jose Christian College	790 S 12th St	San Jose	CA	95112
San Jose High Academy	275 N 24th St	San Jose	CA	95116
San Jose High Academy Plus (Cont.)	275 N 24th St	San Jose	CA	95116
Santa Teresa High	6150 Snell Rd	San Jose	CA	95123
Sheppard (William L.) Middle	480 Rough and Ready Rd	San Jose	CA	95133
Shirakawa (George) Sr. (Elementary)	665 Wool Creek Dr	San Jose	CA	95112
Sierramont Junior High	3155 Kimlee Dr	San Jose	CA	95132
Silver Oak Elementary	5000 Farnsworth Dr	San Jose	CA	95138
South Valley Carden	1921 Clarinda Way	San Jose	CA	95124
St. Elizabeth's Day Home	950 St. Elizabeth Dr	San Jose	CA	95126
St. Victor Elementary	3150 Sierra Rd	San Jose	CA	95132
Stonegate Elementary	2605 Gassman Dr	San Jose	CA	95121
Summerdale Elementary	1100 Summerdale Dr	San Jose	CA	95132
Toyon Elementary	995 Bard St	San Jose	CA	95127
Union Junior High	2130 Los Gatos-Almaden Rd	San Jose	CA	95124
Valle Vista Elementary	2400 Flint	San Jose	CA	95148
White Road Baptist Academy	480 S White Rd	San Jose	CA	95127
Williams Elementary	1150 Rajkovich Way	San Jose	CA	95120
Yerba Buena High	1855 Lucretia Ave	San Jose	CA	95122
San Martin	100 North St	San Martin	CA	95046
San Martin/Gwinn Elementary	100 North St	San Martin	CA	95046
Bowers Elementary	2755 Barkley Ave	Santa Clara	CA	95051
Briarwood Elementary	1960 Townsend Ave	Santa Clara	CA	95051
Cabrillo Middle	2550 Cabrillo Ave	Santa Clara	CA	95051
Cedarwood Sudbury	2545 Warburton Ave	Santa Clara	CA	95051
Don Callejon	4176 Lick Mill Blvd	Santa Clara	CA	95054
Eisenhower Elementary	277 Rodonavan Dr	Santa Clara	CA	95051
Jubilee Academy	2499 Homestead Rd	Santa Clara	CA	94086
Laurelwood Elementary	955 Teal Dr	Santa Clara	CA	95051
Millikin Elementary	2720 Sonoma Place	Santa Clara	CA	95051
Mission College	3000 Mission College Blvd	Santa Clara	CA	95054
Neighborhood Christian	1290 Pomeroy Ave	Santa Clara	CA	95051
One World Montessori	2495 Cabrillo Ave	Santa Clara	CA	95051
Pomeroy Elementary	1250 Pomeroy Ave	Santa Clara	CA	95051
Santa Clara Christian	3421 Monroe St	Santa Clara	CA	95051
St. Justin	2655 Homestead Rd	Santa Clara	CA	95051
Sutter Elementary	3200 Forbes Ave	Santa Clara	CA	95051
Wilcox (Adrian C.) High	3250 Monroe St	Santa Clara	CA	95051
Blue Hills Elementary	12300 Desanka Ave	Saratoga	CA	95070
Marshall Lane Elementary	14114 Marilyn Ln	Saratoga	CA	95070

Table 3.6-3. Schools within One-Quarter Mile of the Project Area

School	Street	City	State	Zip
Redwood Junior High	13925 Fruitvale Ave	Saratoga	CA	95070
Sacred Heart Elementary	13718 Saratoga Ave	Saratoga	CA	95070
Saratoga Elementary	14592 Oak St	Saratoga	CA	95070
Saratoga High	20300 Herriman Ave	Saratoga	CA	95070
St. Andrews Elementary	13601 Saratoga Ave	Saratoga	CA	95070
West Valley College	14000 Fruitvale Ave	Saratoga	CA	95070
Escondido Elementary	890 Escondido Rd	Stanford	CA	94305
Nixon (Lucille)	171 Stanford Ave	Stanford	CA	94305
Braly Elementary	675 Gail Ave	Sunnyvale	CA	94086
Cupertino Middle	1650 S Bernardo Ave	Sunnyvale	CA	94087
Fairwood Elementary	1110 Fairwood Ave	Sunnyvale	CA	94089
Peterson Middle	1380 Rosalia Ave	Sunnyvale	CA	94087
Rainbow Montessori	790 E Duane Ave	Sunnyvale	CA	94085
San Miguel Elementary	777 San Miguel Ave	Sunnyvale	CA	94086
Stocklmeir	592 Dunholme Way	Sunnyvale	CA	94087
The Kings Academy High	562 N Britton Ave	Sunnyvale	CA	94086
West Valley Elementary	635 Belleville Way	Sunnyvale	CA	94087

Source: Data compile by Horizon Water and Environment in 2011 from information provided by SCVWD



Horizon WATER AND ENVIRONMENT

Figure 3.6-4a: Schools within One-Quarter Mile of Project Area, Northern Portion

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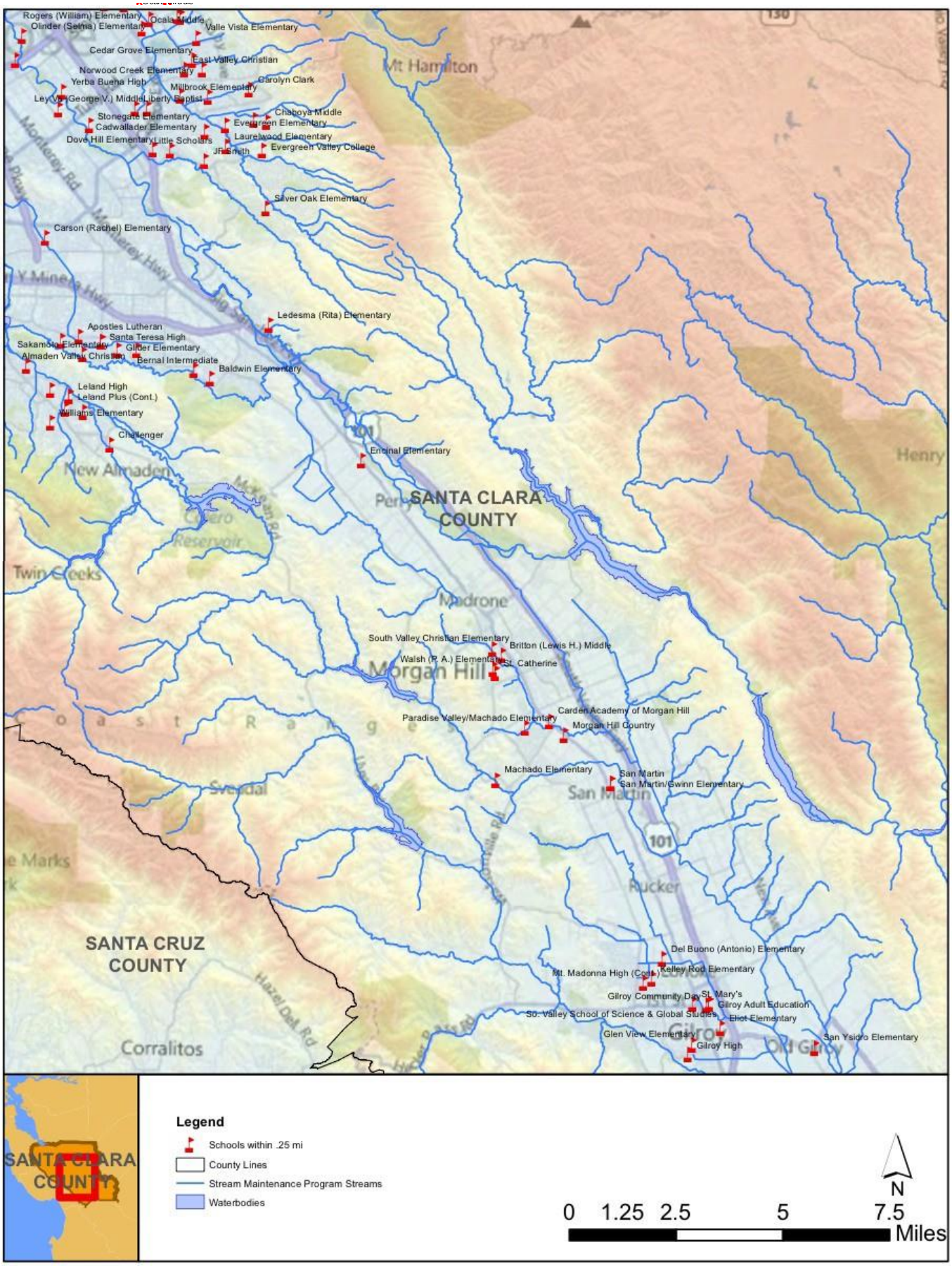

Horizon WATER AND ENVIRONMENT

Figure 3.6-4b. Schools within One-Quarter Mile of Project Area, Southern Portion

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Vegetation Management

Vegetation management activities would include the application of herbicides. Improper use or storage of these materials near schools could pose a potential risk to children who may be exposed.

Management of Animal Conflicts

Lethal control activities as part of the management of animal conflicts could include the use of fumigants and bait traps with rodenticides. Fumigants would be placed directly in animal (squirrel or gopher) burrows. Bait traps would be designed to prevent the capture of nontargeted species. In addition, use of zinc phosphide, if it were to come into contact with water, could convert to phosphine gas, an inhalation hazard. Although the application or use of these materials would be performed to target specific species (squirrels and gophers) and used in accordance with State law, their use could pose a potential risk to children when work activities occurred in proximity to schools and the materials were accidentally ingested or inhaled.

Minor Maintenance

Minor maintenance activities of the Proposed Project could involve the use of heavy equipment for grading or minor sediment removal activities and the subsequent use of hazardous materials (i.e., fuels, oil) associated with this equipment. The accidental release of these materials near schools could potentially expose children to them.

Canal Maintenance

Because routine canal maintenance activities would include all general work activities, effects would be the same as described above for other routine maintenance work.

Applicable Best Management Practices

The following BMPs would be implemented as part of SMP activities. Descriptions of each BMP are provided in Chapter 2, *Project Description*.

BMP GEN-24: On-Site Hazardous Materials Management
BMP GEN-25: Existing Hazardous Materials
BMP GEN-26: Spill Prevention and Response
BMP GEN-30: Vehicle and Equipment Maintenance
BMP GEN-31: Vehicle Cleaning
BMP GEN-32: Vehicle and Equipment Fueling
BMP ANI-1: Avoid Redistribution of Rodenticides
BMP HM-4: Posting and Notification for Pesticide Use

Conclusion

Implementation of BMPs would minimize the potential risks associated with the use of hazardous materials during Proposed Project activities, by properly storing and managing these materials, minimizing the transport of these materials to any local water bodies, notifying local residents of the use of pesticides, and designing bait traps for targeted species (that typically would have standard design features, such as openings that would be difficult for non-target species to enter). Maintenance activities located near schools would

not pose any significant safety hazards or threats from hazardous material release, and they would have a less-than-significant impact. No mitigation would be required.

Mitigation Measures: No mitigation is required.

Impact HAZ-6: Exacerbate Wildland Fires (Significance Criterion F; Less than Significant)

The primary fire season in the Project Area extends from late summer through fall, when conditions are driest and air temperatures are high. According to the Wildland Fire Threat Area maps provided by the California Department of Forestry and Fire Protection (Figures 3.6-1 and 3.6-2), wildfire threat is most extreme at the highest elevations, while the fire threat is the least in the lowest elevations of the county (California Department of Forestry and Fire Protection 2007). In the Project Area, very high fire hazard areas in LRAs occur east of the municipalities of Saratoga, Los Gatos, and Morgan Hill, and in a few unincorporated areas of the county (Figure 3.6-2). As shown in Figures 3.6-1 and 3.6-2, upper tributaries of Stevens, Los Gatos, Llagas, and Uvas creeks are within high and very high fire hazard areas. The potential use of equipment which would involve flames or could result in a spark in dry vegetated areas would present a wildland fire threat.

Vegetation Management

Vegetation management activities for the Proposed Project would potentially include mowing, discing, and flaming activities. Such activities around dry vegetation could cause uncontrolled fires, if the equipment was not used cautiously.

Other Maintenance Activities

Other SMP Update activities (bank stabilization, sediment removal, minor maintenance, management of animal conflicts, and canal maintenance) would potentially require the use of heavy equipment to stabilize channel banks, remove sediments, perform grading, and/or physically alter animal habitats. The use of heavy equipment near dry vegetation could present a potential wildland fire threat similar to that described for vegetation management activities.

Applicable Best Management Practices

The following BMPs would be implemented as part of SMP Update activities. Descriptions of each BMP are provided in Chapter 2, *Project Description*.

BMP GEN-28: Fire Prevention
BMP GEN-36: Public Outreach
BMP VEG-4: Use Flamers with Caution
BMP VEG-5: Conduct Flaming During Appropriate Weather and Seasonal Conditions

Conclusion

Through implementation of BMPs GEN-28, VEG-4, and VEG-5, flaming equipment would be used cautiously during Proposed Project activities, and other maintenance activities would be performed in a way to minimize the potential for the creation of wildland fires. In

addition, SCVWD would obtain the required burn permit or authorization from applicable city or county fire marshals before using any flaming equipment. Therefore, this impact would be less than significant and no mitigation would be required.

Mitigation Measures: No mitigation is required.

Impact HAZ-7: Disposal of Contaminated Sediments (Significance Criterion A; Less than Significant)

SMP Update channels (and to a lesser extent, canals) within the Project Area would function to receive and transport stormwater runoff. Stormwater runoff could contain urban contaminants, such as automobile-related contaminants, pesticides, and fertilizers. Many of these contaminants could bind with sediment in the channel bed, where they could accumulate. When sediment was removed, a potential would exist for toxic concentrations of contaminants to be present in the excavated sediment at levels considered hazardous, if released into the environment or if people or wildlife were exposed to it. Additionally, as discussed under Impact HAZ-3, the Guadalupe River watershed is known to contain hazardous levels of mercury. Sediment removed from this area may require special handling and disposal for hazardous levels of mercury.

Applicable Best Management Practices

The following BMPs would be implemented as part of SMP Update activities. Descriptions of each BMP are provided in Chapter 2, *Project Description*.

BMP GEN-3: Avoid Exposing Soils with High Mercury Levels

Conclusion

Implementation of BMPs would minimize the exposure of contaminated soils by Proposed Project activities and provide for contaminated soils to be handled and disposed in compliance with all applicable laws and regulations. Therefore, this impact would be less than significant and no mitigation would be required.

Mitigation Measures: No mitigation is required.

Chapter 3.7

HYDROLOGY AND GEOMORPHOLOGY

3.7 Hydrology and Geomorphology

3.7.1 Introduction

This section presents the regulatory setting, environmental setting, and potential impacts of the Proposed Project as related to hydrology and geomorphology.

Hydrology is the science (or study) of water in the natural environment, with a focus on the circulation and distribution of water as expressed in the hydrologic cycle or water balance (Goudie 1994). *Geomorphology* is the study of the earth's surface, its landforms and the processes that shape them. Within geomorphology, fluvial geomorphology is the more specific study of rivers and streams, and typically includes aspects of hydrology (the quantity and timing of watershed runoff that enters the river), hydraulics (the behavior of channelized flows in the river), and sediment dynamics (how sediment is variably eroded, transported, and deposited along the river continuum).

This section evaluates the potential for Proposed Project activities to affect the geomorphic form and function of rivers and creeks in the Project Area. Although the disciplines of fluvial geomorphology, hydrology, and hydraulics are extensive, the focus of this discussion is to consider how stream flow, stream and river features, and fluvial processes affect the physical functions that support aquatic and riparian habitats and water quality conditions. Therefore, this section supports the information presented in Section 3.3, *Biological Resources* and Section 3.13, *Water Quality*. Specifically, this section provides an overview of the existing hydrologic and geomorphic setting in the Project Area.

3.7.2 Regulatory Setting

No federal, state, regional, or local plans, policies, regulations, laws, or ordinances specifically address the geomorphology of rivers and streams in the Project Area. In practice, regulatory agencies (including the Regional Water Quality Control Board, California Department of Fish and Game, and National Marine Fisheries Service) encourage the use of geomorphic principles in the design and maintenance of stream channels and banks. Although no specific statutory requirements mandate that such measures be applied or implemented, the issuance of discretionary permits by regulatory agencies often are predicated on application of geomorphic principles in the design of instream and bank protection projects.

In recent years, state and local agencies that regulate stormwater have focused on addressing the impacts of urban hydromodification. *Hydromodification* is a process whereby surface runoff is increased because of increased impervious surfaces. The delivery time of surface runoff to creeks is reduced, and peak discharge rates in the creeks are increased. Hydromodification can lead to increased erosion in channels downstream of areas with increased peak discharges, and thus increasing sediment delivery further downstream.

Hydromodification management approaches also focus on the control of runoff, where it is generated at development parcels (source control) or considered in regards to instream erosion protection for streams subject to increased runoff. Proposed Project activities would not result in any increases in source runoff.

The Santa Clara Valley Urban Runoff Pollution Prevention Program is an association of thirteen cities and towns in Santa Clara Valley, the County of Santa Clara, and the Santa Clara Valley Water District that share a common National Pollution Discharge Elimination System (NPDES) permit to discharge stormwater to South San Francisco Bay. The NPDES permit requires co-permittees to manage increases in runoff peak flows, volumes, and durations from projects creating more than one acre of impervious surface that may cause downstream erosion, through the implementation of a Hydromodification Management Plan (HMP). The final HMP, adopted by the Water Board on July 20, 2005, delineates areas where increases in runoff are most likely to impact channel health and water quality and provides management options for maintaining pre-project runoff patterns. See Section 3.13, *Water Quality* for more information on NPDES permitting. The HMP includes several BMPs to minimize the hydrologic impacts of new development. These measures reduce the potential for development to generate damaging runoff that further destabilizes streams in the Santa Clara Basin. Although no regulatory authority is associated with the HMP that directly applies to the SMP Update, the provisions of the HMP influence stream geomorphology within the Project Area.

Other examples of hydromodification-related regulations in the Project Area include the Pajaro River Sediment Total Maximum Daily Load (TMDL) (including the San Benito River and Uvas, Llagas, and Rider Creeks, Figure 2-6) (Central Coast RWQCB 2007). As discussed in Section 3.13, *Water Quality,* the Pajaro Watershed has experienced acute erosion and sedimentation problems as a result of urban and agricultural encroachment on streams, poor and outdated drainage infrastructure (i.e., ditches, culverts, and roads), stream channelization, and other land use changes leading to increased runoff. The Pajaro River Sediment TMDL establishes sediment allocations for various land uses, targeting the greatest load reductions for agricultural activities, roads, and gravel mines. The Pajaro River Sediment TMDL also establishes a Land Disturbance Prohibition that addresses the controllable discharge of soil, silt, or earthen material from various land use activities and modifications (Central Coast RWQCB 2007).

3.7.3 Environmental Setting

Climate and Hydrology

Surface water hydrology (primarily runoff and stream flow) is largely a function of climate, land cover, and soil. In much of California, including Santa Clara County, surface hydrology also is influenced by water resources management that may capture, store, release, or transfer surface water across or between watersheds. The Project Area experiences a Mediterranean type climate, characterized by warm, dry summers and cool, wet winters. Precipitation is mainly concentrated in the winter months and falls primarily as rain, though the high elevations of the Santa Cruz Mountains and Diablo Range can receive limited snowfall. Weather in the region is subject to high annual variability as well as

longer-term climatic cycles, including the Pacific-North American Oscillation, the El Niño Southern Oscillation, and the Pacific Decadal Oscillation (Andrews et al. 2004:337–348). These cycles affect temperature, precipitation, and the frequency of extreme weather events.

Rainfall, land cover, soil structure, soil moisture, slope, watershed size, reservoir operations, and other factors all influence the magnitude and duration of flows (or discharge) in rivers and streams in the Project Area. Urbanized lands with a higher proportion of impervious surfaces and reduced infiltration generally demonstrate a rapid runoff response to rainfall events. Such "flashy" hydrologic systems are noted for the short lag-times between rainfall and peak discharge and show very steep (needle-like) rising limbs of storm hydrographs[1]. Unregulated streams (i.e., those without water supply reservoirs, or located above impoundments) also may show more rapid runoff response compared to streams that have structural features that provide runoff retention or detention. Although typically unregulated, streams tend also to be surrounded by land uses that have higher rates of infiltration, reducing the amount of runoff.

Many of the streams in the Project Area are downstream of dams, and flows on these streams are regulated by these dams for water supply purposes. On regulated creek systems, peak discharges are reduced, the frequency/duration relationships are more equitable (less extreme), and base flow discharge (non-storm flow) typically extends into the later spring, summer, and fall months compared to non-regulated streams. Also, several of the reservoirs in the Project Area release flow through the summer months to recharge groundwater aquifers.

To understand Project Area hydrology, it is useful to compare representative hydrographs from various Project Area watersheds. Four representative hydrographs from the Guadalupe River, Coyote Creek, Upper Penitencia Creek, and Llagas Creek are shown in Figures 3.7-1a and 3.7-1b. All four of these creeks are regulated by upstream reservoirs. The figures show the long-term mean daily discharge for the four stations. The Guadalupe River and Coyote Creek are the largest streams in Santa Clara County, and both drain north into San Francisco Bay. Penitencia Creek is a tributary to Coyote Creek and drains into Coyote Creek in San Jose. Llagas Creek is in the Pajaro Watershed and flows south into the Pajaro River, and ultimately into Monterey Bay.

The pattern shown on each of the mean daily hydrographs in Figures 3.7-1a and 3.7-1b exemplify the Mediterranean type climate in the Project Area, with most of the stream flow in the winter and spring months and a much smaller base flow in the summer months. For example, as shown in the Coyote Creek hydrograph, for over a 10-year recorded period, the highest average mean daily flow of 191 cubic feet per second (cfs) occurred during early March, while the lowest average mean daily flow of 13 cfs (about one fifteenth as large) occurred at the end of July. The Guadalupe River, Coyote Creek, and Penitencia Creek all show a similar pattern of higher stream flow during the winter and early spring and lower flows during the summer.

[1] A hydrograph is a graph or measure of stream flow over time, typically with discharge plotted along the vertical axis and time charted along the horizontal axis.

In comparison to the mean daily flows shown in Figures 3.7-1a and 3.7-1b, Figure 3.7-2 shows peak flow discharges on the Guadalupe River for most of the years recorded between 1930 and 2002. Like the mean daily discharges, the peak discharge record also highlights the annual variability in stream flow that is characteristic of streams in the Project Area. The highest peak flow of 11,000 cfs, recorded in 1995, is over 80 times larger than the lowest peak flow 125 cfs, recorded in 1960. The distribution of peak flows over time on the Guadalupe River shows no discernable pattern, which emphasizes the unpredictability of Mediterranean type climate streams. A comparison from 2004 to 2009 of the peak flows of Coyote Creek (which drains north into San Francisco Bay) and Llagas Creek (which drains south into the Pajaro River) shows that although both creeks follow the same general pattern of higher peak flows in 2006 and 2008, and a lower peak flow in 2007, Coyote Creek shows more variability in peak flows (Figure 3.7-3). This could be caused in part by the relative locations of the stream gages, the difference in watershed size, or the degree to which flows are managed in each watershed. Coyote Creek's stream gage captures a much larger portion of a larger watershed (319 square miles out of a 320-square mile watershed) and is closer to the mouth of the creek, while Llagas Creek's stream gage is closer to the headwaters of the creek and in a smaller watershed (gaging 9.63 miles of a 104-square mile watershed).

Geomorphology

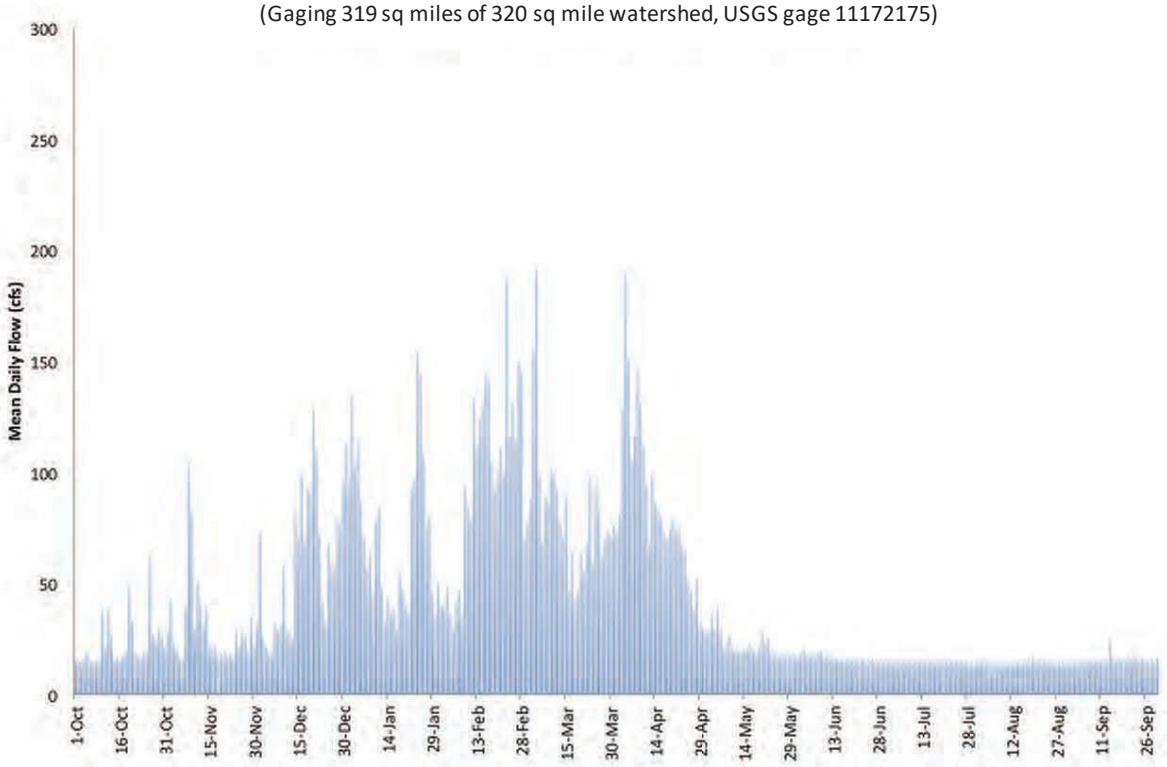
Many factors influence the geomorphology of rivers and streams, including geology, hydrology, climate, land use, and vegetation. This section describes regional geomorphic patterns in Santa Clara County, and then describes the individual watershed areas in the Project Area where stream maintenance occurs. This discussion concludes with a description of the primary channel types in the Project Area, and a summary of known changes in the Project Area since the 2002 SMP was implemented.

Regional Setting

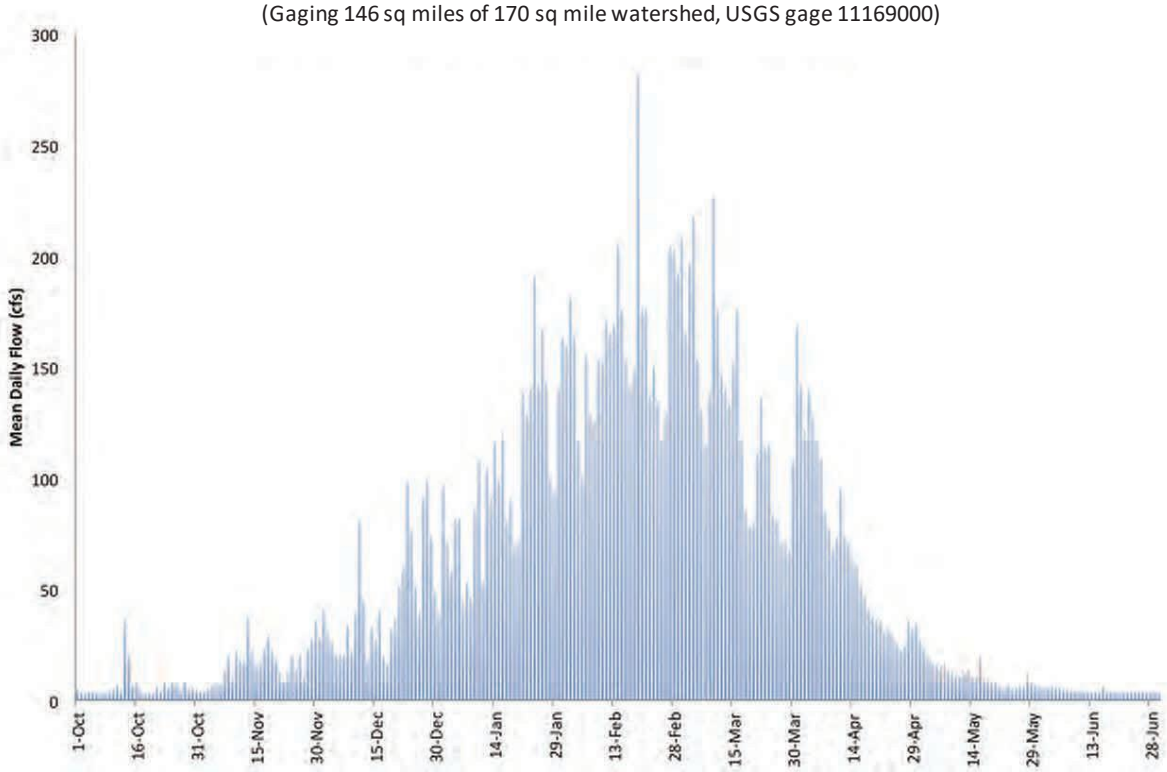
Santa Clara County is situated in the Central Coast Range province of California. The Central Coast Range is characterized by its northwest-southeast trending mountain ranges. Typically, the ranges are separated by structural depressions (valleys) that fill with alluvium (stream transported sediment) derived from the adjacent ranges. Most often, the alluvial valleys contain a primary or "trunk" stream that collects runoff and sediment from the side valley tributary streams (generally to the east and west) that ascend higher in the contributing watershed toward the ridgelines.

This general pattern holds true in Santa Clara County, with the Santa Cruz Mountains to the west and the southern Diablo Range to the east. These two ranges frame the Santa Clara Basin below (Figure 2-1), which drains to San Francisco Bay. In the southern Project Area, the Gilroy Valley of the Pajaro Watershed serves as the central alluvial valley between the Santa Cruz Mountains and Diablo Ranges. The Pajaro Watershed drains to Monterey Bay, as shown in Figure 2-1.

Mean Daily Discharge of Coyote Creek above Highway 237 at Milpitas
Based on Recorded Data, 1999E2009
(Gaging 319 sq miles of 320 sq mile watershed, USGS gage 11172175)



Mean Daily Discharge of Guadalupe River, at San Jose
Based on Recorded Data, 1930E2003
(Gaging 146 sq miles of 170 sq mile watershed, USGS gage 11169000)



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Horizon WATER and ENVIRONMENT

Figure 3.7+1a
Representative Hydrographs from Project Area Watersheds

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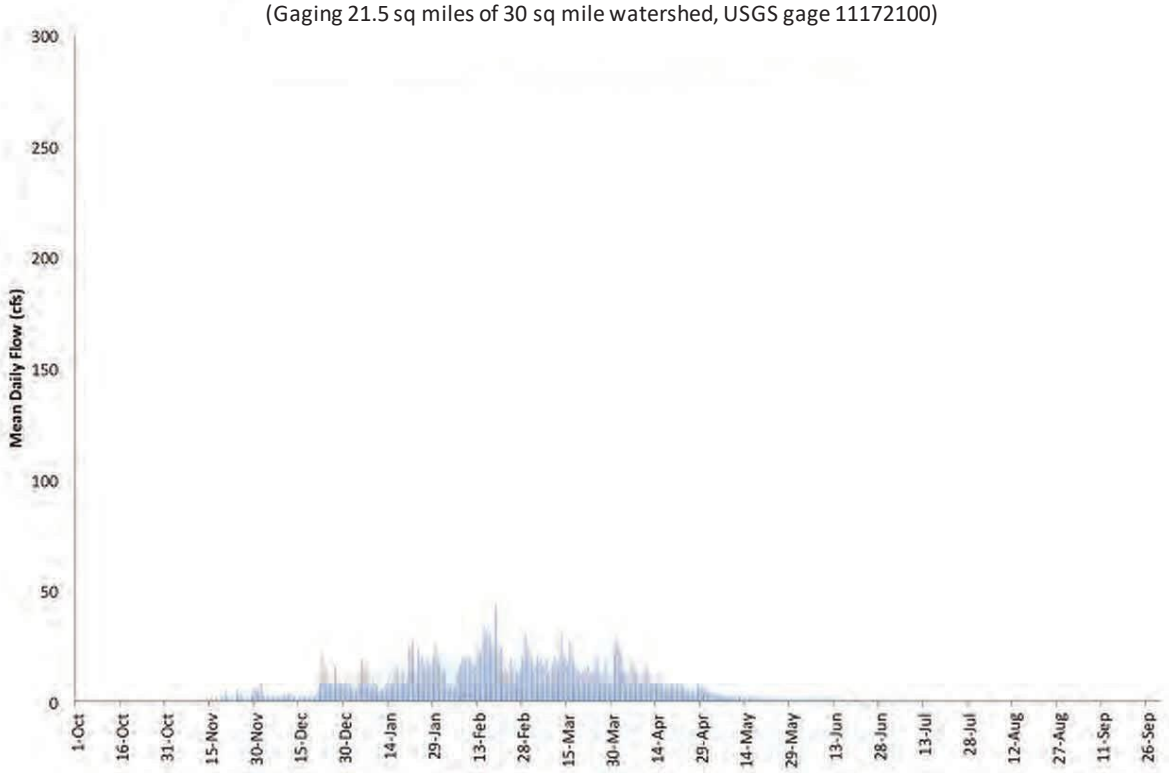
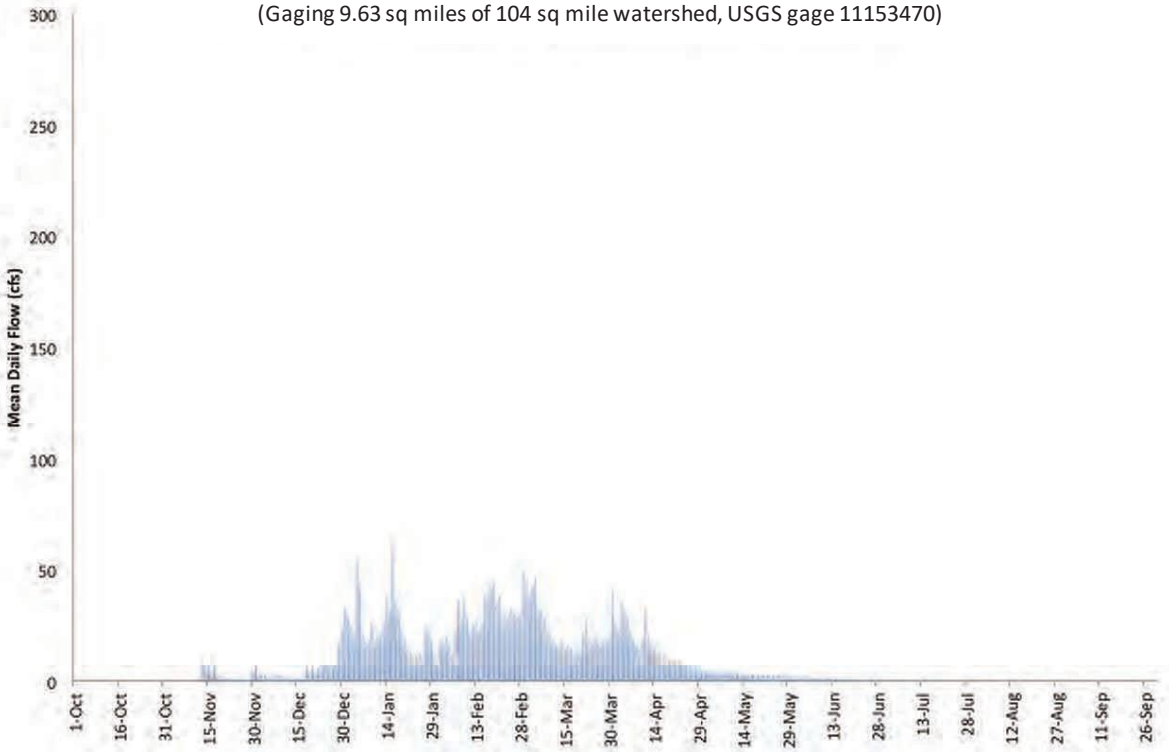
Mean Daily Discharge of Upper Penitencia Creek, San Jose
Based on Recorded Data, 1962F1987
(Gaging 21.5 sq miles of 30 sq mile watershed, USGS gage 11172100)



Mean Daily Discharge of Llagas Creek above Chesbro Reservoir Near Morgan Hill
Based on Recorded Data, 1972F2009
(Gaging 9.63 sq miles of 104 sq mile watershed, USGS gage 11153470)



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Horizon WATER and ENVIRONMENT

Figure 3.7+1b
Representative Hydrographs from Project Area Watersheds

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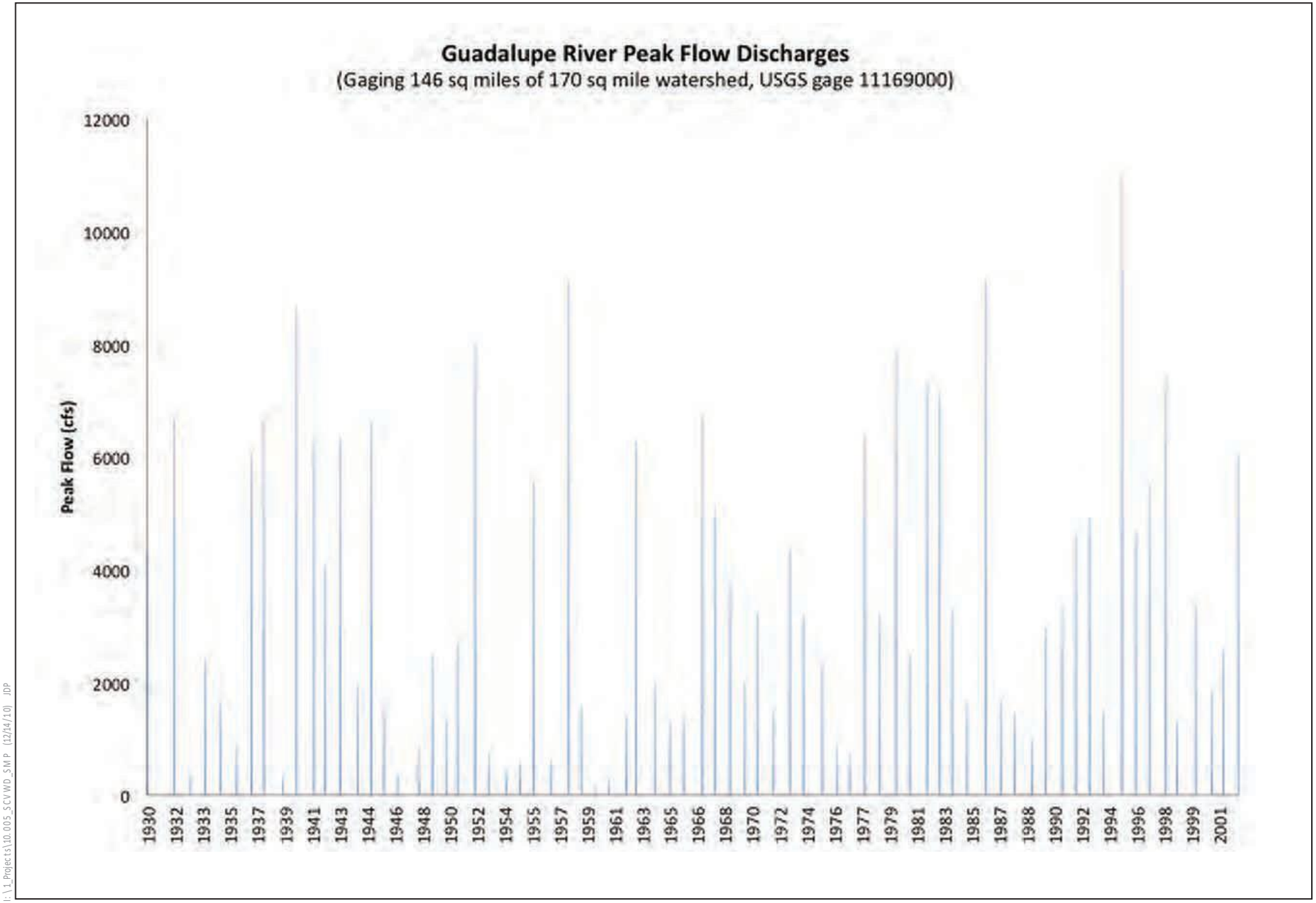

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Horizon
WATER and ENVIRONMENT

Figure 3.7+2
Guadalupe River Peak Flow Discharges

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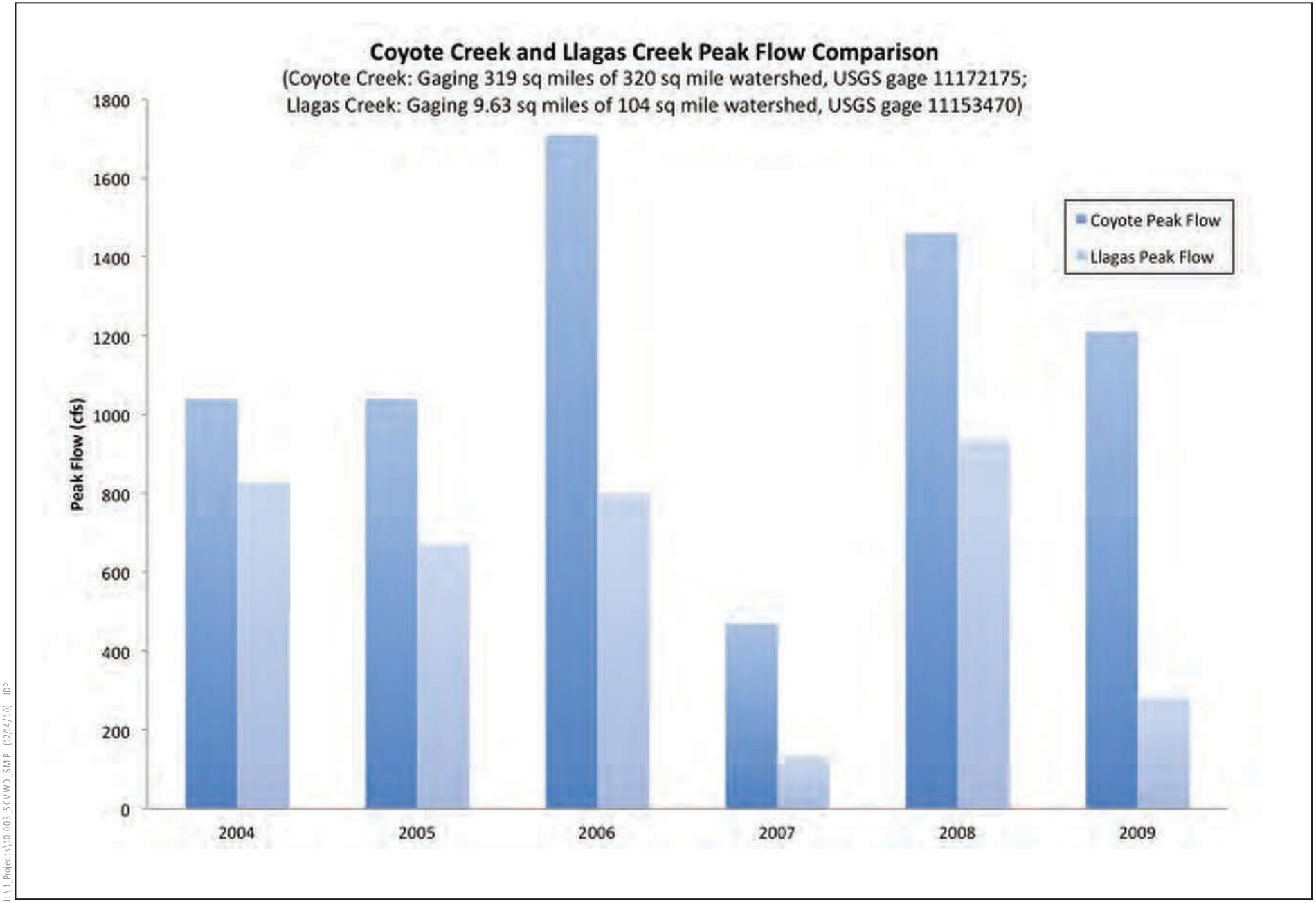

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Horizon
WATER and ENVIRONMENT

Figure 3.7+3
Comparison of Peak Flows+Coyote Creek and Llagas Creek

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The ridge-valley structure of Santa Clara County presents a three-part continuum of geomorphic conditions, with crystalline or bedrock areas in the upper watersheds, transitioning to foothill alluvial fans, then to lower watershed bays and alluvial plains. These geomorphic zones are described next, following Helley et al. (1979), SCVWD (2002), and PWA (2002).

Bedrock Uplands

Bedrock uplands form the steep, mountainous headwater terrain of the principle drainages in the Project Area. In the western Project Area (Figure 2-1), the eastern slopes of the Santa Cruz Mountains form the headwaters of many Project Area waterways, including San Francisquito Creek, Adobe Creek, and the Guadalupe River. The underlying bedrock geology in this region is commonly the Franciscan Complex, a formation of compressed, uplifted, and rotated marine sedimentary materials that was deposited in the early Cretaceous Period (approximately 146 to 100 million years ago) (Norris and Webb 1990, Sullivan and Galehouse 1991). Locally, younger Mesozoic meta-sedimentary and volcanic rocks with smaller quantities of Tertiary sandstones, siltstones, and mudstones are exposed (PWA 2002). In the eastern Project Area, elevations in the Diablo Range vary from 500 to 2,800 feet above mean sea level, with slopes similar to those on the eastern Santa Cruz Mountains (SCVWD 2001). In addition to the Franciscan Complex geology, the Diablo Range includes the characteristic sandstone and mudstone depositional layers of the Great Valley Sequence. Similar to the Santa Cruz Mountains, stream channels in the Diablo Range are steep and flow through deeply incised valleys with little or no floodplain area.

In terms of climate, the steep ridgelines and relatively high elevations of the Santa Cruz Mountains generate a strong orographic effect (increased cooling and precipitation when air masses are forced up and over mountain fronts) on winter storms (cyclones) that approach from the west and southwest, laden with moisture from the Pacific Ocean. The Santa Cruz Mountains area receives the highest average rainfall totals in the county, ranging from 30 to 50 inches per year. The combination of high rainfall, steep gradients, weathered bedrock, and active landslides creates the potential for the watershed to produce high sediment yields.

The Diablo Range in the eastern Project Area receives substantially less average rainfall than the Santa Cruz Mountains, ranging from 20 to 32 inches, caused by a “rain shadow” effect as fronts move from the ocean over ranges toward the interior. Similar to the Santa Cruz Mountains, stream channels in the Diablo Range are steep and often flow through deeply incised valleys with little or no floodplain area. Active erosion in the Diablo Range includes downslope mass movement of fractured bedrock, such as debris slides and rock falls (SCVWD 2001). Fluvial geomorphic processes in this range include the headward (upstream) erosion of streambeds to form incised channels.

In several drainages (e.g., Coyote, Alamitos, Guadalupe, and Los Gatos creeks), the existence of reservoirs has effectively reduced the delivery of coarse sediment from the watershed uplands to the alluvial fans/plains below. The fine material (typically finer material and washload held in suspension) that is not trapped by reservoirs is transported downstream, and can collect and deposit in the stream channels of the Project Area (PWA 2002, SCVURPPP 2006). In addition, reservoirs can alter the geomorphology of downstream

channels by changing the magnitude, frequency, duration, and timing of stream flows. Typically, reservoirs reduce the magnitude and frequency of flood events. Drainages without reservoirs in the mountain and/or foothill regions deliver higher sediment loads to the alluvial plains below.

Typically, no Proposed Project stream maintenance activities would occur in bedrock uplands, as these are above the 1000-foot elevation contour.

Foothill Alluvial Fans

The foothill alluvial fans in the Project Area are found downstream of the bedrock uplands and provide a topographic transition to the alluvial plains further downstream in the watershed. Alluvial fans collect stored sediment, much of it coarse gravel and sand. The characteristic process of alluvial fans involves distributary channels that migrate (if unconstrained) and distribute sediment across the fan surface. In the Coast Ranges, alluvial fans are typically geologically young depositional landforms from the Quaternary Period (the last 1.8 million years). Although depositional when viewed through longer geologic time scales, in the short term, present-day alluvial fans can function variably as zones of sediment erosion, sediment transport, or sediment deposition. Many of the current alluvial fan channels in the Project Area, particularly in the upper fan zones, are incising and transporting coarse sediments downstream (PWA 2002). Gullying and headward erosion through the alluvial fans in many instances have been caused or exacerbated by historic land use practices, development encroachment on stream corridors, and the channelization of streams that have essentially fixed their locations. Where streambanks have been artificially steepened, rotational slumps (the movement of a mass of soil and rock downslope and rotating) and other slope failures can occur (SCVWD 2001).

Proposed Project activities that would occur in the foothill alluvial fans typically include bank protection, sediment removal, and vegetation management.Bay Plain and Alluvial Valleys

The floodplains and alluvial valleys situated between the foothills and San Francisco Bay are formed of relatively young sedimentary deposits, dating from the Holocene epoch of the last 10,000 years. Sediment grain sizes are coarsest near the foothills and alluvial fans and become finer moving downstream toward San Francisco and Monterey bays. Whereas upper alluvial fans may slope up to a 5 percent gradient, in the lower plain regions stream slopes typically are less than 1 percent. Before large-scale human modification and flood protection activities, sediment deposition in the alluvial plains occurred primarily during moderate to large floods, with coarse material depositing over riverbanks to form natural levees and finer sediments dispersed over the broader floodplain further from the channel. The lower bay plain is composed of medium to fine grained alluvium and estuarine deposits. Many of these deposits were laid during estuarine backwater flooding conditions when winter stream flows met high tides (PWA 2002). Near the margins of San Francisco Bay, estuarine sediments intergrade with fine alluvium in the deltas of SCVWD-maintained streams; extensive areas of artificial fill and diked baylands also are found.

Although the processes that shaped the Bay plain and lower alluvial valleys have largely been disrupted through channelization and construction of artificial levees, the lower valley

and Bay plain zone continues to be highly depositional. Engineered stream channelization in this lower watershed zone (and its current maintenance) has nearly eliminated past floodplain processes, such as lateral channel migration, which is now either non-existent or highly unlikely. In this lower watershed zone, some localized streambank erosion occurs as streams attempt to dissipate energy by restoring plan form sinuosity (i.e., meander patterns). These processes and their relationship to Proposed Project maintenance activities are discussed further in Section 3.7.4, *Impact Analysis*.

Project Area Watersheds

Santa Clara Basin

The Santa Clara Basin includes approximately half of Santa Clara County and small parts of San Mateo and Alameda Counties (Figure 2-1). The Santa Clara Basin consists of San Francisco Bay south of the Dumbarton Bridge and the 824 square miles that drain, generally in a northerly direction, to the Bay. The Diablo Range and the Santa Cruz Mountains form the eastern, western, and southern basin boundaries. Land uses within the Santa Clara Basin range from residential, commercial, and industrial uses in the northern portion of the basin to a primarily rural southern portion with cattle ranching, water-supply catchments, and scattered low-density residential development (SCBWMI 2000).

For the purposes of resource management, SCVWD has divided the Santa Clara Basin into five watershed management areas (WMA): Lower Peninsula, West Valley, Guadalupe, Coyote, and Pajaro WMAs (Figures 2-2 through 2-6). A general description of these watersheds is discussed next. Following this discussion, Table 3.7-1 provides a summary of the main drainages in each WMA.

Lower Peninsula WMA

The Lower Peninsula WMA (98 square miles) is located in the northwest portion of the Santa Clara Basin (Figures 2-1 and 2-2). The Lower Peninsula headwaters begin in the Santa Cruz Mountains at elevations greater than 2,500 feet. Tributary creeks fall steeply from the headwaters region to the more gently sloping alluvial fans and plains. Major streams under SCVWD's management within the Lower Peninsula WMA include San Francisquito, Stevens, Permanente, Adobe, Barron, and Matadero creeks (WMI 2007). These streams generally flow northward, conveying flows to the Palo Alto Flood Basin and, ultimately, San Francisco Bay. However, portions of Buckeye, Adobe, Permanente, and Stevens creeks flow more easterly/westerly, where their stream valleys follow the San Andreas Fault Zone, which disrupts their drainage pattern (Figure 2-2).

San Francisquito Creek marks the border between Santa Clara and San Mateo counties. SCVWD only maintains the side of the creek that is within Santa Clara County. Up to 1,500 cfs of runoff in Permanente Creek may be diverted to Stevens Creek via the Permanente Creek Diversion (Figure 2-2), built in 1959. During storm events, high flows from Barron Creek may be diverted to Matadero Creek via the Barron Creek Bypass structure. SCVWD manages Stevens Creek Reservoir (3,465 acre-feet), the largest reservoir

in the Lower Peninsula Watershed, for water supply storage purposes with incidental flood protection benefits[2].

Land uses in the Lower Peninsula Watershed generally consist of open space and low-density residential development in the upper watershed, with higher density residential and commercial development on the valley floor. Municipalities that are partially or entirely with the WMA include Los Altos Hills, Palo Alto, Mountain View, Los Altos, Cupertino, and Sunnyvale. A large quarry is in the upper Permanente Watershed and mines limestone for cement production.

West Valley WMA

The West Valley WMA (85 square miles) is situated southeast of the Lower Peninsula Watershed and northwest of the Guadalupe Watershed (Figures 2-1 and 2-3). The major natural drainages in this WMA are Calabazas, San Tomas Aquino, and Saratoga creeks. These streams begin as natural channels at relatively low elevations in the Santa Cruz Mountains (less than 1,500 feet) (WMI 2007). As these streams transition from the alluvial fan regions to the Bay plain, they become highly modified channels that traverse the Bay plain and ultimately discharge to Guadalupe Slough. The Sunnyvale West and East Channels, constructed channels that provide drainage for large portions of Sunnyvale, also discharge to Guadalupe Slough. Like much of the western Santa Clara Basin, land use in the upper West Valley Watershed is primarily forest or undeveloped rangeland with low-density residential development, while the lower watershed is highly developed for residential and commercial uses. However, within the Calabazas drainage, several areas of heavy industry are in the upper watershed. Municipalities that are partially or entirely within this WMA include Sunnyvale, Santa Clara, Cupertino, San Jose, Santa Clara, Campbell, Monte Sereno, Los Gatos, and Saratoga. (SCBWMI 2000)

Guadalupe WMA

The Guadalupe WMA (Figures 2-1 and 2-4) drains approximately 170 square miles, beginning in the eastern Santa Cruz Mountains near the summit of Loma Prieta (3,790 feet above mean sea level) and eventually discharging to San Francisco Bay via Alviso Slough. The Guadalupe River, the largest drainage in the watershed, begins at the confluence of Alamitos and Guadalupe creeks and flows north through heavily urbanized portions of San Jose and Santa Clara to Alviso Slough. Alamitos Creek flows northwesterly to Almaden Reservoir (2,000 acre-feet), and then flows northerly to its confluence with Calero Creek, and eventually to its confluence with Guadalupe Creek. Three main tributaries, Ross, Canoas, and Los Gatos creeks, join the Guadalupe River on the Bay plain as it flows north towards the Bay. SCVWD operates five reservoirs in the Guadalupe Watershed for water supply storage purposes (with incidental flood protection benefits): Guadalupe, Calero, Almaden, Lexington, and Vasona Reservoirs. Municipalities that are partially or entirely with this WMA include Campbell, Santa Clara, Los Gatos, Monte Sereno, and San Jose.

[2] SCVWD does not handle maintenance activities at reservoirs or dams as part of its Stream Maintenance Program. However, stream maintenance at the reservoir outfall below the dam is included, as is any necessary stream maintenance upstream of the reservoir (below the 1,000-foot contour).

Coyote WMA

The Coyote WMA is the largest watershed in the Santa Clara Basin, encompassing over 320 square miles (Figures 2-1 and 2-5). The Coyote Watershed drains the west-facing slopes of the Diablo Range that lie within the Santa Clara Basin. The eastern and southern portions of the watershed are upland areas with elevations up to 4,000 feet above mean sea level; the northern and western portions encompass the valley floor. Coyote Creek is the principal drainage in the watershed; 29 major tributaries drain into Coyote Creek including Upper Penitencia Creek, Berryessa Creek, Lower Silver Creek, and Fisher Creek (SCVWD 2001). Streams in the watershed generally drain in a northwesterly direction to San Francisco Bay. Coyote and Anderson reservoirs (22,925 and 89,073 acre-feet, respectively) capture runoff from the upper Coyote Watershed. Anderson Reservoir's purpose is to facilitate groundwater recharge in the Santa Clara Valley groundwater basin, provide emergency water supply, and provide flood protection (PVWMA et al. 2007). Flows in the lower watershed are highly regulated by these reservoirs, which are managed largely for groundwater recharge. The Hayward and Calaveras faults are major potentially active earthquake faults that cross the watershed. The upper Coyote Watershed includes unincorporated, predominantly agricultural areas. The entire city of Milpitas and portions of San Jose and Morgan Hill lie within the watershed boundaries (SCVWD 2001).

Pajaro WMA

The Pajaro WMA is located within San Benito, Santa Clara, Santa Cruz, and Monterey counties and encompasses approximately 1,300 square miles (Figures 2-1 and 2-6) (PVWMA et al. 2007). The Pajaro Watershed is one of the Central Coast's largest watersheds and is well-known for its world-class agricultural soils and powerful flooding characteristics (DWR 2009). Most of the watershed is mountainous or hilly, with level lands confined to the floodplains of Pajaro River and its tributaries (Central Coast RWQCB 2005). Unlike streams of the Santa Clara Basin, the Pajaro River drains directly to the Pacific Ocean, near the geographic center of Monterey Bay.

Major sub-watersheds within the Pajaro River Basin include the San Benito River and Tres Pinos, Uvas, Llagas, and Corralitos creeks, the last three of which are within the Project Area. Agriculture has long been the dominant land use in the watershed and is a major source of nutrients and sediment loading to the Pajaro River. However, in recent years, substantial portions of the upper watershed area have been developed into residential subdivisions. In addition to residential and agricultural uses, historic mercury mining activities occurred in the Hernandez Lake area and gravel mining occurred along Pajaro and San Benito rivers. (Central Coast RWQCB 2005)

Major reservoirs in the Pajaro Watershed include the Chesbro and Uvas reservoirs. Chesbro Reservoir discharges to Llagas Creek, and Uvas Reservoir discharges to Uvas Creek. Anderson Reservoir discharges to Coyote Creek, outside of the Pajaro Watershed, but was historically connected to the Pajaro River Basin via a pipeline. The purpose of Chesbro and Uvas reservoirs is to facilitate groundwater recharge in the Gilroy–Hollister groundwater basin (Chesbro Reservoir also is managed for flood protection). Municipalities that are partially or entirely with this WMA include San Jose, Morgan Hill, and Gilroy.

Table 3.7-1. Principal Creeks in Project Area Watersheds

Creek or Channel	Drainage Area (square miles)	Channel Length (approx. miles)	Main Tributaries
Santa Clara Basin			
Lower Peninsula Watershed			
Adobe Creek	10	NP	Purissima Creek
Barron Creek	3	NP	N/A
Matadero Creek	14	NP	Deer Creek; Stanford Channel
Permanente Creek	17	13	Hale Creek
San Francisquito Creek	45	12.5	Los Trancos Creek
Stevens Creek	29	19	Permanente Creek Diversion; Heney Creek
West Valley Watershed			
Calabazas Creek	17	13.3	Prospect, Rodeo, and Regnart Creeks; El Camino Storm Drain
San Tomas Aquino Creek	22	16	Saratoga, Smith, Vasona, and Wildcat Creeks
Saratoga Creek	17	15	N/A
Sunnyvale West Channel	7.5	3	N/A
Sunnyvale East Channel	7.1	6	N/A
Guadalupe Watershed			
Alamitos Creek	37	8.5	Golf, Greystone, Randol, Calero and Herbert Creeks; Jacques Gulch; and Barrett Canyon
Guadalupe Creek	15.2	NP	Shannon, Pheasant, and Hicks Creeks
Los Gatos Creek	51	NP	Limekiln Canyon, Soda Spring, Aldercroft, Black, Briggs, and Hendrys Creeks; Moody Gulch
Guadalupe River	170	NP	Alamitos, Guadalupe, Ross, Canoas, and Los Gatos Creeks
Coyote Watershed			
Coyote Creek	320	42	Fisher, Upper Silver, Lower Silver, and Upper Penitencia Creeks, and other creeks tributary to the two reservoirs on Coyote Creek
Lower Penitencia Creek	30	NP	East Penitencia Channel and Berryessa Creek
Pajaro Basin			
Pajaro Watershed			
Pajaro River	1,300	NP	Pacheco, Llagas, and Uvas-Carnadero Creeks

N/A – not applicable, NP – not provided
Sources: SCBWMI 2000, PVWMA et al. 2007, WMI 2007

SMP Channel Types and Drainage Features

All Proposed Project maintenance activities would take place in channels below the 1,000-foot elevation contour. Within this zone, four primary channel types are found in which maintenance may occur: natural or mixed[3] channels on alluvial fans, mixed or concrete tributary channels on the Bay plain, mixed or concrete mainstem channels on the Bay plain, and tidally-influenced channels. An overview of each of these channel types is described next; proposed maintenance activities related to channel morphology also are discussed.

Type 1: Natural or mixed channels on alluvial fans

As streams transition from headwaters and canyons in the bedrock uplands to the foothill alluvial fans, channel slopes decrease and channel widths generally increase. As a result, sediment transport capacity decreases and bedload deposition increases. Unmanaged, sediment deposition in SCVWD-maintained channels reduces flow conveyance capacity, resulting in increased flooding risks. Consequently, under the existing SMP, the SCVWD actively maintains channel capacity by removing accumulated sediment and managing vegetation (to control hydraulic roughness), and it would continue to do so under the Proposed Project. Under the existing SMP, these maintenance activities have occured on numerous creeks throughout the foothills region, including streams such as Permanente, Calabazas, Penitencia, and Alamitos creeks, and such maintenance would continue under the Proposed Project.

Type 2: Mixed or concrete tributary channels on the Bay plain

This stream type includes the small to medium sized channels on the Bay plain that are tributary to the main streams that discharge to the Bay. Some of these channels have been engineered and straightened for flood protection and land development purposes, while others remain in a more natural state. Most of these drainages have seasonal stream flows, unless fed by artificial drainage (e.g., golf courses) or dam releases. Figures 2-11 and 2-13 show a general cross section and a photo example from Sierra Creek for this type of channel.

Channels on the Bay plain are depositional under natural conditions. Historical modifications to these channels, such as expanding cross-sectional areas for flood protection, often increase the rate of sedimentation. In-channel structures (such as weirs, bridges and culverts that control stream grade or alter hydraulics) also may influence sediment transport capacity and depositional patterns in these channels. SCVWD actively maintains channel capacity by removing accumulated sediment and managing vegetation. Streambank protection also is common in this channel type (see Section 3.7.4, *Impact Analysis*).

Type 3: Mixed or concrete mainstem channels on the Bay plain

This channel type includes the major drainages on the valley floor, such as the lower reaches of Adobe, Permanente, Stevens, Calabazas, San Tomas Aquino, and Coyote creeks, the Guadalupe River, and Sunnyvale East and West channels. Figure 2-7 provides a diagrammatical cross section and representative photographs of this channel type.

[3] See Chapter 2, *Project Description* for definitions of "natural" and "mixed" channel types.

Similar to the tributary channels, the main drainages on the Bay plain are depositional under natural conditions. Channelization and channel modification activities that have straightened, widened, and deepened these stream channels have further supported depositional processes. SCVWD has undertaken several capital improvement projects that were intended to reduce the need for ongoing sediment management by restoring the geomorphic function of these channels. This has involved construction of multistage channels and bypass features to more efficiently manage sediment discharge. Nevertheless, in many situations SCVWD must still actively maintain channel capacity by removing accumulated sediment. Bank stabilization, vegetation management, and streambank protection activities also are common in this channel type.

Type 4: Tidally-influenced channels

The delta (river to estuary interface) portions of the Type 3 channels described above are tidally influenced. Figure 2-9 provides representative photographs of this channel type. The channels in this region are typical of brackish tidal sloughs with wide and shallow cross sections and tall emergent vegetation on the channel margins. Substrate is generally poorly consolidated, fine-textured marine and alluvial sediment. Proposed Project maintenance activities in this channel type generally would include bank stabilization, sediment removal, and vegetation management.

Groundwater

The Project Area includes a number of groundwater basins and subbasins, as defined in the *California Water Plan Update* (DWR 2009). The major groundwater basins and subbasins in the project area are the Gilroy–Hollister Valley Basin (which includes the Llagas Area, Bolsa Area, Hollister Area, and San Juan Bautista Area subbasins), the Pajaro Basin, and the Santa Clara Subbasin. The Gilroy–Hollister Valley Basin and the Pajaro Basin are in the Central Coast Hydrologic Region. Within the Central Coast Hydrologic Region, groundwater is an important source of supply, accounting for 83 percent of the total supply for agricultural and urban purposes in 1995. Aquifers in the Central Coast vary, from small inland valleys and coastal terraces to extensive alluvial valleys with multiple layers of aquifers and aquitards. The four subbasins that comprise the Gilroy–Hollister Valley Basin have a combined area of 183,600 acres, most of which is in the Project Area. The Pajaro Basin is bounded to the west by Monterey Bay and to the east by the San Andreas Fault and the Santa Cruz Mountains. The Pajaro Basin has a total area of 76,800 acres, of which only a small portion is in the Project Area. Groundwater levels have been decreasing over time in the Pajaro Basin because of pumping in excess of recharge (DWR 2009).

The Santa Clara Subbasin is located in the San Francisco Bay Hydrologic Region and has an area of 153,600 acres, most of which is in the Project Area. The Santa Clara Subbasin is bounded by the Diablo Range on the west, the Santa Cruz Mountains in the east, and is in a structural trough parallel to the Coast Ranges. Land subsidence has been a problem in the Santa Clara Subbasin in the past, and an annual monitoring program has been set up to reduce land subsidence and promote groundwater recharge to ensure groundwater will continue to be a viable water supply in the future (DWR 2009).

3.7.4 Impact Analysis

Methodology

Potential impacts to hydrologic conditions and geomorphic resources were evaluated based on how the Proposed Project could affect hydrologic or geomorphic functions. Alterations to flooding conditions also were considered, under the basic assumption that stream maintenance activities would be intended to reduce flood risk. Potential short-term and long-term impacts of primary maintenance activities (sediment removal, vegetation management, and bank stabilization) were considered.

Proposed Project maintenance activities would not change runoff sources, storm drainage pathways, or outlets (outfalls) from the storm drainage network to downstream areas. Therefore, this impact analysis focuses on anticipated changes occurring within the stream channels to be maintained, and how such changes may influence other aspects of the geomorphic system. In general, the proposed sediment removal, bank stabilization, and vegetation management activities would be a continuation of SCVWD's current SMP practices. The SMP Update process would include some areas (as indicated in Figures 2-14 through 2-38) where maintenance activities did not occur during the first decade of the SMP (2002-2012) but would occur between 2012 and 2022.

Criteria for Determining Significance

For the purposes of this analysis, the Proposed Project would result in a significant impact on hydrologic or geomorphic resources if it would:

A. substantially alter existing drainage courses or patterns of the site or area, including changes to the timing or amount of runoff or alteration of the course of a stream or river in a manner which would result in substantial erosion, siltation, or stream instability;

B. contribute runoff water that would exceed the capacity of existing or planned storm water drainage systems;

C. substantially deplete surface water supplies;

D. place structures within a 100-year flood hazard area which would impede or redirect flood flows;

E. expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam;

F. substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level; or

G. expose people or structures to a significant risk of inundation by seiche, tsunami, or mudflow.

Because the intended purpose and primary objective of the current SMP is to reduce the risk of flooding, many of the criteria above are inherently counter to the objectives of the Proposed Project. Therefore, the review of potential environmental impacts that is presented next focuses on the potential for increased erosion and sedimentation caused by Proposed Project activities. The evaluation is divided into two time scales: near-term and short-term potential impacts that could occur during the immediate staging, preparation, and implementation of proposed maintenance activities; and longer-term potential effects.

Environmental Impacts

Impact HYD-1: Short-Term Instream Erosion or Sedimentation from Sediment Management Activities (Significance Criterion A; Less than Significant)

The Proposed Project would involve sediment removal and related activities, such as construction of temporary coffer dams for dewatering, culvert clearing and debris removal. During the immediate channel access, staging, and sediment removal activities, erosion from the streambanks or sediment loading into the channel and scouring may increase if the Proposed Project creates sudden vertical transitions downstream from sediment removal sites. Furthermore, sediment loads to the channel could increase if stockpiled soils or sediment-laden water at work sites enters the channel or if new areas are disturbed for staging activities. Erosion or sediment loading into the channel also could occur if the activities do not restore low-flow channels as closely as possible to their original location and form, except in areas where the original location could cause future erosion.

Applicable Best Management Practices

The following BMPs would be implemented as part of the SMP Update to minimize the potential for short-term instream erosion and sedimentation from proposed maintenance activities. Descriptions of each BMP are provided in Chapter 2, *Project Description*.

BMP GEN-4: Minimize the Area of Disturbance
BMP GEN-20: Erosion and Sediment Control Measures
BMP GEN-21: Staging and Stockpiling of Materials
BMP GEN-22: Sediment Transport
BMP GEN-23: Stream Access
BMP SED-2: Prevent Scour Downstream of Sediment Removal
BMP SED-3: Restore Channel Features
BMP SED-4: Berm Bypass

Conclusion

Implementation of the BMPs listed above would prevent sediment at work sites from entering the channel and would, following sediment removal, restore low-flow channels as closely as possible to their original location and form where the original location would not cause future erosion. Therefore, the Proposed Project would not significantly affect instream erosion or sedimentation rates. This impact would be less than significant and no mitigation would be required.

Mitigation Measures: No mitigation is required.

Impact HYD-2: Long-Term Instream Erosion or Sedimentation from Sediment Removal Activities (Significance Criterion A; Beneficial)

Although the proposed sediment removal activities are not anticipated to cause short-term adverse impacts through excessive erosion/sedimentation, the long-term potential effects of removing an average of over 45,000 cubic yards of sediment annually[4] were considered. In general, the flood protection channel network is not a system in geomorphic equilibrium, where sediment gains are balanced with sediment losses. The system is in disequilibrium because most reaches are net depositional, and sediment accumulates over time.

The cause for this net depositional condition is a result of disruption of the sediment delivery system, associated with historic land development in the region, subsidence of the Valley floor caused by historic groundwater pumping, and the construction of the flood protection channel network. Historically, before development and channelization, the streams in the Project Area periodically overtopped their banks and deposited sediment onto the adjacent floodplain. Non-channelized streams also migrated across the floodplain, seeking the most efficient pathway downstream. These pre-channelization geomorphic processes can be reviewed in standard geomorphic texts such as Dunne & Leopold (1978), Ritter (1986), or Mount (1995). Once flood protection channels were established in the Project Area to reduce overbank flooding, these channels lost their ability to spread and distribute sediments across adjacent floodplains. Upstream sediment sources, however, have not been reduced. The net result of these processes is that sediment is delivered to channels that are restricted from depositing and storing this sediment on their adjacent floodplains. The channels themselves have become the reservoirs for sediment storage. The baseline flood protection channel system is and will continue to be depositional and requires periodic sediment removal to help the streams' design flow conveyance capacities to be maintained.

Removing abundant sediment volumes from a system that is in geomorphic equilibrium may cause adverse geomorphic impacts to the overall system and, in particular, to downstream channel processes. In such a situation, the downstream channels would be "starved" of sediment transported from upstream. Such channels "starved" of sediment could respond by using the energy that would otherwise be used to transport sediment into eroding local instream sediment. This is often the origin of channel incision.

However, for the Proposed Project, the baseline condition is net depositional, whereby sediment loading far outpaces the ability for channels to transport their material downstream. The sediment removed from the Project Area's channels under the Proposed Program typically would not outpace the sediment transport capacity of downstream reaches. In other words, because the flood protection channels in the Project Area in general receive an abundant sediment supply, removing a portion of this sediment through proposed maintenance activities would not create "starved" channels downstream.

Additionally, from an ecological viewpoint, excessive buildup of sediment in low gradient Project Area channels causes a succession of the instream habitat toward monocultural stands of cattail marsh. Removing the sediment could have a beneficial effect by providing a

[4] SCVWD has removed an average 46,411 cubic yards of sediment annually under the current SMP.

more varied habitat until ongoing sediment aggradation triggers the need for sediment removal again. *Conclusion*

In the long term, Proposed Project sediment management activities would provide beneficial flood protection and no impact would occur.

Mitigation Measures: No mitigation is required.

Impact HYD-3: Short-Term Erosion or Sedimentation from Vegetation Management Activities (Significance Criterion A; Less than Significant)

Instream emergent vegetation (such as cattails) develops well in non-shaded flood protection channels with shallow and low velocity flows during drier season low-flow conditions. Cattail growth results in constricting the channel bottom with thick vegetation stalks and trapping more fine sediment, resulting in further bed aggradation. Proposed vegetation management activities would remove such instream emergent vegetation that traps sediment and obstructs channel flows. The Proposed Project also would thin/prune and remove instream woody vegetation that obstructs or diverts flows, resulting in an increased flood risk. When such vegetation is removed, the opportunity for erosion caused by channel bed disturbance and exposure increases. Deposited sediment could migrate to downstream areas during subsequent flow events in the channel. This potentially eroded sediment would have the potential to travel downstream and aggrade in a downstream location. Effects of the eroded sediment on aquatic habitat are described in Section 3.3, *Biological Resources*.

Applicable Best Management Practices

The following BMPs would be implemented as part of the SMP Update to minimize the potential for short-term erosion or sedimentation from proposed vegetation management activities. Descriptions of each BMP are provided in Chapter 2, *Project Description*.

BMP VEG-1: Minimize Local Erosion Increase from In-channel Vegetation Removal
BMP REVEG-1: Seeding

Conclusion

Implementing these BMPs would help minimize the potential for any increase in local erosion or sedimentation that may result from in-channel vegetation removal. Therefore, the Proposed Project would have a less-than-significant impact on short-term erosion or sedimentation and no mitigation would be required.

Mitigation Measures: No mitigation is required.

Impact HYD-4: Short-Term Erosion or Sedimentation from Bank Stabilization Activities (Significance Criterion A; Less than Significant)

Bank stabilization activities would be implemented along stream banks where failure or severe erosion had occurred. At bank stabilization sites, SCVWD would continue to evaluate the cause of bank erosion or failure and would prepare a treatment design to provide a

stable bank form while minimizing potential impacts. As described in the 2012 SMP Manual (Appendix A), SCVWD has template designs for up to 28 bank stabilization approaches. Most commonly, SCVWD would repair failing banks with earth, rock, and other natural materials, backfilled to a stable slope. Where possible, SCVWD would encourage use of biotechnical approaches, including the use of willow wattles, vegetation mattresses, and planting of native riparian trees at the top of banks and the toe of slopes to create additional bank stability and increased canopy in the channel. Once the eroded or failed bank was stabilized and new plantings became established, the active source of eroding sediment would be eliminated, providing a longer-term benefit. However, during implementation of bank stabilization projects, the banks would be exposed and vulnerable to ongoing erosion.

The use of hardscape bank treatments (such as rip rap) would be used where other alternatives would not result in a sufficiently stabilized slope. A typical condition where a hardscape solution may be used is to stabilize the bank upstream and downstream of an outfall culvert to prevent reoccurring erosion. In such cases, rock may be used adjacent to the culvert outfall to help maintain the stability of the culvert. When repairs were made, banks would be recontoured to match the adjacent bank slope, where possible (i.e., returned to pre-failure condition). If site conditions allowed, the bank slope may be stabilized at a shallower slope (reducing the likelihood of renewed failure), but only if the work is conducted within the confines of the original channel as-built condition. Stabilized banks would be flush with the existing upstream and downstream bank slope. As a result, stream flows would not be altered such that velocity would be increased or erosion would result near or downstream of the project site. It is unlikely that measurable changes to stream flow characteristics in the project reach would occur. Overall, hardscape would be minimally used in proposed bank stabilization projects, placement of hardscape would be localized to small areas, and bank stabilization sites would be contoured to match the existing bank. The amount of sediment generated by bank stabilization activities would be relatively small.

Applicable Best Management Practices

The following BMPs would be implemented as part of the SMP Update to minimize the potential for short-term erosion or sedimentation from proposed bank stabilization activities. Descriptions of each BMP are provided in Chapter 2, *Project Description*.

BMP BANK-1: Bank Stabilization Design to Prevent Erosion Downstream
BMP BANK-3: Bank Stabilization Post-Construction Maintenance

Conclusion

The Proposed Project would minimize erosion caused by bank stabilization, by ensuring that site design measures would be used to prevent potential downstream erosion impacts and by maintaining or repairing bank stabilization projects that have been damaged by winter flows. Therefore, the impact would be less than significant and no mitigation would be required.

Mitigation Measures: No mitigation is required.

Impact HYD-5: Long-Term Erosion and Sedimentation from Vegetation Management and Bank Stabilization Activities (Significance Criterion A; Beneficial)

Proposed vegetation removal, revegetation, and bank stabilization activities would have long-term beneficial effects on potential erosion and sedimentation. Pruning and selective removal of trees on streambanks that have the potential to capture debris or redirect erosive flows toward the banks would tend to reduce erosion/sedimentation processes along streambanks. Similarly, the stabilization and treatment of streambanks that are actively eroding or slumping would tend to reduce the long-term erosion and sedimentation of an actively destabilized streambank.

Conclusion

Proposed project maintenance activities would stabilize eroding streambanks such that long-term erosion and sedimentation from the banks would be reduced over time. Therefore, the proposed maintenance activities would be beneficial and no impact would occur.

Mitigation Measures: No mitigation is required.

Impact HYD-6: Harm to People, Structures, or Water Quality from Flooding (Significance Criteria D and E; Beneficial)

The Proposed Project would seek to improve flow conveyance conditions, to reduce the potential for flooding. The proposed maintenance activities would occur within the designated 100-year flood zone of channels in the Project Area.

Sediment Removal

Sediment removal activities would restore the flow conveyance capacity of Project Area channels to their design levels. Therefore, these proposed maintenance activities would reduce the potential for flooding. The Proposed Project would not involve construction of any new structures within the 100-year flood zone that could result in harm to people or structures.

Proposed sediment removal activities would include ground-disturbing activities that would occur primarily during the dry season, avoiding or minimizing the potential for flooding. However, many work sites would occur at perennial streams that carry water year-round. To conduct proposed maintenance activities such as sediment removal and bank stabilization, work sites would sometimes require dewatering, which would involve installation of a cofferdam or similar structure to prevent water from entering the work site. If the ponded water behind the temporary dewatering berm was accidently released, localized inundation of the work site and downstream area could result. However, the amount of stored water would not be substantial and would be entirely held within the flood protection channel, so no potential would exist to damage structures or harm people.

Vegetation Management

Proposed vegetation management activities would restore the flow conveyance capacity of Project Area channels to their design levels by removing instream vegetation.

Bank Stabilization

Proposed bank stabilization activities would return creek channels to their operational design. Bank stabilization activities may require the use of dewatering structures. Potential effects of the use of these structures would be similar to that described for sediment removal activities.

Other Maintenance Activities

Other proposed maintenance activities (management of animal conflicts, minor maintenance, and canal maintenance) also would generally improve the flow conveyance capacity of Project Area channels by removing trash or sediment from culverts and other crossings, and/or repairing levees that had been damaged by animals.

Applicable Best Management Practices

The following BMPs would be implemented as part of the SMP Update to minimize the potential for harm to people, structures, or water quality from flooding. Descriptions of each BMP are provided in Chapter 2, *Project Description*.

BMP GEN-33: Dewatering for Non-Tidal Sites
BMP GEN-34: Dewatering in Tidal Work Areas

Conclusion

The Proposed Project would decrease the possibility of flooding within the Project Area. The proposed maintenance activities would be beneficial and no impact would occur.

Mitigation Measures: No mitigation is required.

Impact HYD-7: Alterations to the Recharge, Quality, or Quantity of Groundwater (Significance Criterion F; Beneficial)

The Proposed Project would not utilize groundwater supplies; thus, no adverse impact on groundwater supply would occur. The majority of the creek channels (and some canals) maintained by SCVWD would be earthen, as opposed to having concrete-lined beds and banks. These creek channels (and certain canals) would provide passive avenues for groundwater recharge because water would be allowed to percolate down to shallow and deeper groundwater aquifers.

The current sediment transport conditions in the Project Area encourage accumulation of fine materials in stream channels, particularly where vegetation is overgrown and where the longitudinal slope of the channel is low. Groundwater recharge capacity is reduced in these locations as fine sediments clog pores and interstices between bed sediments. Over time, this reduces the rate at which surface water in the channels percolates down to the groundwater below.

Sediment Removal

Annual sediment removal activities and reshaping of the channel in some locations to keep sediment from depositing in the channel bed would improve infiltration and percolation to groundwater.

Bank Stabilization

Stabilizing failing stream banks would assist in reducing fine sediment inputs to the channels.

Vegetation Management

Vegetation management activities would support the growth of riparian vegetation along channel banks and would result in beneficial impacts to groundwater recharge by assisting in the reduction of fine sediment inputs to the channels.

Minor Maintenance

Minor maintenance activities would include sediment removal that would have similar beneficial impacts on groundwater quantities as those described for sediment removal activities.

Management of Animal Conflicts

Reductions in animal burrowing would assist in reducing fine sediment inputs from the levees to the channels.

Canal Maintenance

Because routine canal maintenance activities would include all general work activities, effects would be the same as described above for other routine maintenance activities.

Conclusion

The proposed sediment removal, bank stabilization, in-channel and riparian vegetation management, minor maintenance, canal maintenance, and management of animal conflicts would not deplete groundwater supplies or interfere with groundwater recharge. By reducing the amount of fine sediment in the channels/canals, these activities would improve percolation of surface water and increase groundwater levels. These proposed activities would be considered beneficial and no impact would occur.

Mitigation Measures: No mitigation is required.

Impact HYD-8: Occurrence of Seiche, Tsunami, or Mudflow (Significance Criterion G; No Impact)

The northern portion of the Project Area is located at the southern margin of San Francisco Bay. The California Emergency Management Agency has mapped areas that could be potentially inundated by tsunamis in the northern portion of the Project Area. In the Project Area, reaches of Coyote Creek and the Guadalupe River (extending approximately one-half mile inland from their mouths), the reach of Alviso Slough (extending one mile inland from its mouth), and less than one-half mile of the tidal mudflats and sloughs west of Alviso Slough are susceptible to tsunami inundation (CEMA et al. 2010).

Bank Stabilization

Proposed bank stabilization activities would not exacerbate tsunami conditions in areas that would be susceptible to tsunamis. In addition, no large bodies of water would be present in the Project Area that could create seiche hazards. Furthermore, bank stabilization activities would reduce the potential for impacts of mudflow.

Other Maintenance Activities

Similar to bank stabilization activities, other proposed maintenance activities (sediment removal, vegetation management, minor maintenance, management of animal conflicts, and canal maintenance) would not be located in tsunami-susceptible areas or near any seiche hazard areas. Management of animal conflicts may involve physical habitat alterations (such as compaction of levee faces or reconstruction of levee side slopes) that potentially could reduce any mudflow impacts. Vegetation management activities would generally remove in-channel vegetation and would not remove vegetation on levee slopes or stream banks such that the potential for mudflows would be increased. Sediment removal and minor maintenance activities generally would not affect any potential mudflows. Because routine canal maintenance activities would include all general work activities, effects would be the same as described for other routine maintenance activities.

Conclusion

No impacts related to seiche, tsunami, or mudflows would occur.

Mitigation Measures: No mitigation is required.

Impact HYD-9: Geomorphic Effects of Sediment Reuse (Significance Criterion A; Less than Significant)

Sediment reused at Pond A8 or another similar location would be placed to improve the geomorphic function in these locations. The Proposed Project would not reuse sediment in locations that could result in adverse geomorphic effects.

Conclusion

The geomorphic impact of sediment reuse would be beneficial in some cases, and in no case would have significant impacts. No mitigation would be required.

Mitigation Measures: No mitigation is required.

Impact HYD-10: Creation of Runoff Water and Depletion of Surface Water Supplies (Significance Criteria B and C; Less than Significant)

The Proposed Project could contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems if it substantially increased the quantity of existing impermeable surface areas in the Project Area. Surface water supplies could be depleted if the Proposed Project generated significant water demands that were met by surface water supplies.

Bank Stabilization

Proposed bank stabilization activities are not a projected activity and would be performed on an as-needed-basis. These activities could include the use of concrete to repair unstable lined channels or side slopes. The use of concrete as part of these activities is not anticipated to be significant and would not substantially increase impermeable surface areas in the Project Area or subsequently contribute increases in runoff such that the capacity of existing or planned stormwater drainage systems were exceeded. The performance of bank stabilization activities may require use of water supplies, including surface water supplies, as detailed under Impact PSU-3 in Section 3.10, *Public Services and Utilities*. However, as described in that impact discussion, trucked-in SCVWD water supplies would be used to meet any water demands of the Proposed Project. Demands of the Proposed Project would not be expected to substantially deplete surface water supplies.

Other Maintenance Activities

Other proposed maintenance activities (sediment removal, minor maintenance, management of animal conflicts, vegetation management, and canal maintenance) could create water demands as described under Impact PSU-3 in Section 3.10, *Public Services and Utilities*. These water demands would be met with trucked-in SCVWD water supplies and would not be anticipated to be substantial or require significant quantities of surface water supplies. These proposed activities would not increase the impermeable surface area in the Project Area and would not create substantial quantities of runoff that would exceed the capacity of existing or planned stormwater drainage systems. The removal of sediments, vegetation, and trash from channels and canals would restore the design capacity of the existing stormwater drainage systems.

Applicable Best Management Practices

The following BMPs would be implemented as part of the SMP Update to minimize the potential for creation of runoff water and depletion of surface water supplies. A description of this BMP is provided in Chapter 2, *Project Description*.

BMP GEN-4: Minimize the Area of Disturbance

Conclusion

The Proposed Project would not substantially alter the existing impermeable surface area or resulting runoff in the Project Area. In addition, the Proposed Project would not substantially deplete surface water supplies. Therefore, this impact would be less than significant and no mitigation would be required.

Mitigation Measures: No mitigation is required.

Impact HYD-11: Short-Term Erosion and Sedimentation from Minor Maintenance, Management of Animal Conflicts, and Canal Maintenance Activities (Significance Criterion A; Beneficial)

Proposed minor maintenance, management of animal conflicts, and canal maintenance activities may involve sediment removal and/or ground-disturbing activities that could affect creek channel erosion and sedimentation processes. Erosion and sedimentation-related effects of these activities would be similar to the effects described above for sediment removal activities, although on a reduced scale. During these activities, sediment loads to the channel could increase if stockpiled soils or sediment-laden water at work sites entered the channel. In addition, increased erosion and scouring could occur following these activities if the minor maintenance activities created sudden vertical transitions downstream from sediment removal sites.

Applicable Best Management Practices

The following BMPs would be implemented as part of the SMP Update to minimize the potential for short-term erosion and sedimentation from proposed maintenance activities. Descriptions of each BMP are provided in Chapter 2, *Project Description*.

BMP GEN-4: Minimize the Area of Disturbance
BMP GEN-20: Erosion and Sediment Control Measures
BMP GEN-21: Staging and Stockpiling of Materials
BMP GEN-22: Sediment Transport
BMP GEN-23: Stream Access
BMP SED-2: Prevent Scour Downstream of Sediment Removal
BMP SED-3: Restore Channel Features
BMP SED-4: Berm Bypass

Conclusion

The Proposed Project would prevent sediment at project sites from entering the channel and would, following sediment removal, restore low-flow channels as closely as possible to their original location and form where the original location would not cause future erosion. Therefore, the Proposed Project would not substantially affect instream erosion or sedimentation rates. This impact would be less than significant and no mitigation would be required.

Mitigation Measures: No mitigation is required.

Impact HYD-12: Long-Term Erosion and Sedimentation from Minor Maintenance, Management of Animal Conflicts, and Canal Maintenance Activities (Significance Criterion A; Beneficial)

Proposed minor maintenance, management of animal conflicts, and canal maintenance activities would minimize long-term erosion and sedimentation effects in creek channels if they removed sediments and/or stabilized creek banks. As described above, most channel reaches in the Project Area are net depositional and require the periodic removal of sediments to maintain channel conveyance capacities. Removal of sediments as part of the proposed minor maintenance activities would be beneficial. Animal conflict management activities, including the reconstruction of levee side slopes or surface compaction of levee faces, would reduce erosion/sedimentation processes along streambanks. Canal maintenance activities could include any of the proposed sediment removal, bank stabilization, vegetation management, or minor maintenance activities and would reduce the long-term erosion and sedimentation effects of an actively destabilized streambank.

Applicable Best Management Practices

None of the BMPs provided in Chapter 2, *Project Description,* are applicable.

Conclusion

The proposed minor maintenance, canal maintenance, and management of animal conflicts would be beneficial to prevention of erosion and sedimentation of destabilized streambanks in the Project Area. No impact would occur.

Mitigation Measures: No mitigation is required.

Chapter 3.8

LAND USE AND PLANNING

3.8 Land Use and Planning

3.8.1 Introduction

This section presents the regulatory setting, environmental setting, and potential impacts of the Proposed Project related to land use and planning. Resources consulted included:

- the General Plans for the cities of Campbell (2001), Cupertino (2005), Gilroy (2002), Los Altos (2002), Milpitas (2002), Monte Sereno (2008), Morgan Hill (2001), Mountain View (1992), San Jose (2009), Santa Clara (2002), Sunnyvale (2009); the town of Los Gatos (2000); and Santa Clara County (1994);

- the General Plan Update for the City of Saratoga (2007) and Town of Los Altos Hills (2007); and

- the Palo Alto Comprehensive Plan (2007).

3.8.2 Regulatory Setting

Federal Plans, Policies, Regulations, and Laws

No federal plans, policies, regulations, or laws related to land use and planning are applicable to the Proposed Project.

State Plans, Policies, Regulations, and Laws

No state plans, policies, regulations, or laws related to land use and planning are applicable to the Proposed Project.

Regional and Local Plans, Policies, Regulations, and Ordinances

The following discussion and Appendix D describe the policies and regulations that are relevant to the analysis of potential land use impacts of the Proposed Project, with a particular focus on those policies and regulations that have been updated since the SMP EIR was certified in 2002.

Governance Policies of the Board (Ends Policies, as of May 2011)

The SCVWD Board of Directors has adopted policies (Ends Policies) to provide goals and other guidance to direct the activities of SCVWD. Those goals most relevant to the Proposed Project are listed in Chapter 2, *Project Description*, and they are summarized briefly below:

Flood Protection Goal 3.1: Natural flood protection for residents, businesses, and visitors

- Balance environmental quality and protection from flooding in a cost effective manner.
- Preserve flood conveyance capacity.

Flood Protection Goal 3.2: Reduced potential for flood damages

- Reduce risk of flood damages in flood prone areas.
- Avoid the creation of expanded flood prone areas.

Water Resources Stewardship Goal 4.1: Healthy creek and bay ecosystems

- Balance water supply, natural flood protection and water resources stewardship functions.
- Improve watersheds, streams, and natural resources.
- Promote awareness of creek and bay ecosystem functions.

Water Resources Stewardship Goal 4.2: Clean, safe water in creeks and bay

- Preserve or improve surface and ground water quality for beneficial uses.
- Promote awareness of water quality and stream stewardship.

Water Resources Stewardship Goal 4.3: Improved quality of life in Santa Clara County through trails, open space and water resources management

- Support additional trails, parks and open space along creeks and in the watersheds when reasonable and appropriate.
- Reduce greenhouse gas emissions when reasonable and appropriate.

3.8.3 Environmental Setting

Most of the creek lengths within SCVWD jurisdiction are within unincorporated Santa Clara County, the City of Gilroy, and the City of San Jose. Within the Project Area, approximately 38 percent of the total creek miles flow through urban (residential, commercial, and industrial) areas, and the remainder flow through non-urban areas. Channels flowing through urban areas are surrounded by residential, commercial, industrial, or institutional (hospitals, schools) development. Outside of urban areas, channels traverse less developed land uses, including rural residential, agricultural and grazing lands, parks, and open space. Although some relatively undeveloped areas are located within urban areas (e.g., urban parks), most of these areas are immediately upstream or downstream of the core urban areas. Because of the additional maintenance requirements in engineered, rather than natural channels, the majority of projected maintenance work is anticipated to occur within

the boundaries of incorporated cities. SCVWD does not have any authority to control land uses under the jurisdiction of cities or Santa Clara County.

Channel maintenance activities in residential areas may be more likely to create impacts because of the higher number of people near work sites. Conversely, channel maintenance activities in streams adjacent to open space, agricultural, and recreational areas may be less likely to create impacts because fewer people would be near work sites and less potential would exist for property damage caused by flooding.

3.8.4 Impact Analysis

Methodology

The analysis of land use and planning was generally qualitative and consisted of an evaluation of applicable land use policies, plans, and programs in the context of the Proposed Project, to identify potential inconsistencies.

Criteria for Determining Significance

For the purposes of this analysis, the Proposed Project would result in a significant impact on land use and planning if it would:

A. physically divide an established community;

B. create substantial conflicts or incompatibility with existing and planned future land uses within or adjacent to the project study area; or

C. conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project.

Conflicts between the Proposed Project and applicable local or regional policies or ordinances protecting biological resources, such as tree preservation ordinances, habitat conservation plans, or other land conservation plans, are discussed in Section 3.3, *Biological Resources*.

Environmental Impacts

Impact LU-1: Division of Existing Neighborhoods or Communities (Significance Criterion A; Less than Significant)

Proposed Project activities would be restricted to channel areas and easements that would provide access to channel areas. The SMP Update would not permanently affect access to any of the surrounding land uses, nor create any new permanent, physical barriers between developed areas. However, any Proposed Project maintenance activities or staging for these activities could cause temporary disruptions to existing roadways or recreational trails connecting existing communities, as described next.

Vegetation Maintenance

Use of mechanical equipment for vegetation removal, vegetation pruning, herbicide application, mowing, discing, flaming, and/or grazing could require temporary access restrictions of the surrounding trails and roadways. These potential disturbances are addressed in Section 3.11, *Recreation* and Section 3.12, *Traffic and Transportation*. As detailed in these sections, these temporary maintenance-related disturbances would be less than significant. Once vegetation maintenance activities were completed, Proposed Project-related access disruptions to existing neighborhoods would cease.

Other Maintenance Activities

Implementation and staging for the remainder of SMP Update activities (sediment removal, bank stabilization, management of animal conflicts, minor maintenance, and canal maintenance) would potentially result in similar disturbances as those described above for vegetation maintenance activities.

Applicable Best Management Practices

The following BMPs would be implemented to prevent maintenance activities from substantially disrupting existing roadways or recreational trails connecting existing communities and to inform the public of any temporary disruptions. Descriptions of each BMP are provided in Chapter 2, *Project Description*.

BMP GEN-4: Minimize the Area of Disturbance
BMP GEN-36: Public Outreach
BMP GEN-37: Implement Public Safety Measures
BMP GEN-39: Planning for Pedestrians, Traffic Flow, and Safety Measures

Conclusion

Because maintenance related to the Proposed Project would be a short-term activity and access disruptions would be temporary, this impact would be less than significant and no mitigation would be required.

Mitigation Measures: No mitigation is required.

Impact LU-2: Incompatibility with Adjacent Land Uses (Significance Criterion B; Less than Significant)

The proposed maintenance activities are not considered "new development" and no new permanent habitable structures would be created. In addition, no project areas would be permanently altered from their ongoing use. In fact, the flood protection services maintained by the Proposed Project would help protect adjacent land uses in many cases. However, as described previously, construction work or staging could temporarily disrupt existing adjacent land uses.

Vegetation Management

Vegetation management activities could result in potential direct and indirect construction impacts on surrounding land uses, which would be substantially similar for all locations and may include traffic delays, trail access disruption, or public safety hazards. Air emissions also could be generated through vehicle use. Vegetation management activities could generate noise emissions from use of mechanized hand tools, mowers, or other equipment. Although these potential impacts are addressed in the relevant resources sections throughout Chapter 3, *Environmental Setting and Impact Analysis* of this document, they have been considered here for their indirect impacts on adjacent land uses. In general, all are considered to be less than significant. Once maintenance activities were completed, Proposed Project-related disturbances to adjacent land uses would cease.

Other Maintenance Activities

Maintenance activities for the remainder of SMP Update activities (sediment removal, bank stabilization, management of animal conflicts, minor maintenance, and canal maintenance) would potentially result in similar disturbances as those described above for vegetation maintenance activities. All of the other SMP activities could require the use of heavy equipment, which also could contribute to noise and air emissions, public safety hazards, traffic delays, and trail access disruption.

Applicable Best Management Practices

The following BMPs would be implemented to prevent maintenance activities from resulting in substantial direct or indirect impacts on the surrounding land uses. Descriptions of each BMP are provided in Chapter 2, *Project Description*.

BMP GEN-4: Minimize the Area of Disturbance
BMP GEN-19: Work Site Housekeeping
BMP GEN-36: Public Outreach
BMP GEN-37: Implement Public Safety Measures
BMP GEN-39: Planning for Pedestrians, Traffic Flow, and Safety Measures

Conclusion

Although temporary impacts would be associated with the proposed activities, the longer-term implementation of the Proposed Project would not alter any existing land uses. Because the construction would be a short-term activity and disruptions to adjacent land uses would be temporary, this impact would be less than significant and no mitigation would be required.

Mitigation Measures: No mitigation is required.

Impact LU-3: Compatibility with Land Uses Plans and Policies (Significance Criterion C; Less than Significant)

Applicable land use plans and policies are described in Appendix D. Although a large number of plans and applicable policies exist, they can be summarized as follows:

- promote shared usage of and access to public agency/utility-owned areas for public recreation;
- protect and maintain natural resources (wildlife, habitats, cultural);
- implement effective mitigation, including preservation and restoration of native vegetation habitat types, and trees;
- encourage multi-jurisdictional partnerships/coordination for countywide improvements and resource protection;
- protect public health and safety;
- minimize risk of injury and property damage caused by flooding;
- provide for safe and environmentally-sensitive land development (enforcement of buffer zones, land use restrictions, pollution/run-off prevention, grading measures);
- protect regional water quality and minimize pesticide application;
- guide effective management and adequate functioning of public facilities (stormwater, canals, parks); or
- conduct flood protection practices in an environmentally sensitive manner (habitat restoration, remove invasive species, remove concrete-lined channels).

As described in Impact LU-2, no work would be conducted that would result in permanent changes to existing land uses. Instead, the implementation of all Proposed Project activities would support the general land use goals and policies of Santa Clara County and its incorporated jurisdictions by providing adequate channel capacities, reducing risk of flooding, and providing enhanced riparian habitat within the Project Area.

Applicable Best Management Practices

All of the BMPs described in Chapter 2, *Project Description* would be applicable and would each meet at least one of the land use plan and policy categories described above.

Conclusion

The Proposed Project would provide for natural resource enhancement and protection, which would support existing land use plans and would not result in incompatibilities with existing and adjacent land uses. Therefore, this impact would be less than significant and no mitigation would be required.

Mitigation Measures: No mitigation is required.

Chapter 3.9

NOISE

3.9 Noise

3.9.1 Introduction

This section describes the regulatory setting, environmental setting, and potential impacts of the Proposed Project related to noise. Maintenance activities under the current SMP bear great similarity to construction activities and have a similar potential for noise generation; therefore, they are treated as such for the purposes of this noise analysis.

Overview of Noise Concepts and Terminology

Noise can be defined as unwanted sound. Therefore, to understand noise impacts, it is important to understand some basic concepts regarding sound. Sound is mechanical energy transmitted by pressure waves in a compressible medium such as air. Sound is characterized by various parameters that include the rate of oscillation of sound waves (frequency), the speed of propagation, and the pressure level or energy content (amplitude). In particular, the sound pressure level is the most common descriptor used to characterize the loudness of an ambient sound level. The decibel (dB) scale is used to quantify sound intensity. Because the difference in sound pressure between sounds at the lower and upper range of human hearing is so large, a logarithmic scale is used to keep sound intensity numbers at a convenient and manageable level. The human ear is not equally sensitive to all frequencies in the entire spectrum, so noise measurements are weighted more heavily for frequencies to which humans are sensitive in a process called "A-weighting," written "dBA."

Different types of measurements are used to characterize the time-varying nature of sound. Below are brief definitions of these measurements and other terms used in this section:

- Sound is a vibratory disturbance created by a vibrating object, which, when transmitted by pressure waves through a medium such as air, can be detected by a receiving mechanism, such as the human ear or a microphone.
- Noise is sound that is loud, unpleasant, unexpected, or otherwise undesirable.
- Decibel (dB) is a unit of measure of sound. It works on a logarithmic scale, which is calculated as the square of the ratio of the pressure amplitude of a sound to a reference sound pressure amplitude (20 micro-pascals).
- A-weighted decibel (dBA) is an overall frequency-weighted sound level in decibels that approximates the frequency response of the human ear.
- Maximum sound level (Lmax) is the maximum sound level measured during the measurement period.
- Minimum sound level (Lmin) is the minimum sound level measured during the measurement period.

- Equivalent sound level (Leq) is the equivalent steady-state sound level that, in a stated period of time, would contain the same acoustical energy as a time-varying sound level during that same period of time.

- Percentile-exceeded sound level (Lxx) is the sound level exceeded a specific percentage of time during a specific time period. As an example, L10 is the sound level exceeded 10% of the time.

- Day-night level (L_{dn}) emphasizes the undesirability of noise occurring during the night. This is accomplished by adding 10 dB to the A-weighted sound levels during the period from 10:00 p.m. to 7:00 a.m.

- Community noise equivalent level (CNEL) is another way of emphasizing the undesirability of noise during the night, which adds 5 dB to the A-weighted sound levels between 7:00 p.m. and 10:00 p.m. and 10 dB added to the A-weighted sound levels between 10:00 p.m. and 7:00 a.m.

L_{dn} and CNEL values rarely differ by more than 1 dB. As a matter of practice, L_{dn} and CNEL values are considered to be equivalent and are treated as such in this analysis. In general, human sound perception is such that a change in sound level of 3 dB is just noticeable, a change of 5 dB is clearly noticeable, and a change of 10 dB is perceived as doubling (for an increase) or halving (for a decrease) the sound level. Table 3.9-1 presents example noise levels for common noise sources; the levels are measured adjacent to the source.

Table 3.9-1. Examples of Common Noise Levels

Source	Noise Level (dBA)
Weakest sound heard by average ear	0
Whisper	30
Normal conversation	60
Ringing telephone	80
Power lawnmower	90
Tractor	96
Hand drill	98
Bulldozer	105
Chain saw	110
Ambulance siren	120
Jet engine at takeoff	140
12-gauge shotgun blast	165

Source: National Institute of Safety and Health 2008

Sensitivity

Sensitive receptors include residents, recreational users, children, recovering sick patients, and anyone else who would be disrupted by unwanted noise. Areas where stream maintenance activities take place may contain potential sensitive receptors to noise generation.

An individual's reaction to noise is determined by the nature and volume of the noise itself as well as by the environment in which the noise occurs, and the individual's tolerance for noise. For example, individuals accustomed to noisy environments or use of loud equipment such as chainsaws are less likely to consider this noise to be intrusive than those who are not. Conversely, the use of chainsaws in areas with low ambient noise levels is more likely to be considered disruptive than usage in areas where noise levels are normally high.

3.9.2 Regulatory Setting

Federal Plans, Policies, Regulations, and Laws

No commonly accepted federal thresholds exist for acceptable levels of noise from construction activities. The Federal Transit Administration (FTA) suggests the guidelines shown in Table 3.9-2 as reasonable criteria for the assessment of construction noise impacts.

Table 3.9-2. FTA-Suggested Construction Noise Criteria

	One-Hour Leq (dBA)	
Land Use	**Day**	**Night**
Residential	90	80
Commercial	100	100
Industrial	100	100

Source: Federal Transit Administration 1995

State Plans, Policies, Regulations, and Laws

State Land Use Compatibility Standards for Community Noise

The California Government Code requires cities and counties to include a noise element in their general plans. The purpose of the noise element is to provide a guide for establishing a pattern of land uses that minimizes the exposure of community residents to excessive noise. The State Office of Planning and Research has published general plan guidelines (California Governor's Office of Planning and Research 2003) that include guidelines for the compatible noise levels for various land uses, presented in Table 3.9-3.

Table 3.9-3. State Land Use Compatibility Standards for Community Noise Environment

Land Use Category	Community Noise Exposure - L_{dn} or CNEL (db)						
	50	55	60	65	70	75	80
Residential – Low Density Single Family, Duplex, Mobile Homes							
Residential - Multi-Family							
Transient Lodging – Motels, Hotels							
Schools, Libraries, Churches, Hospitals, Nursing Homes							
Auditoriums, Concert Halls, Amphitheaters							
Sports Arenas, Outdoor Spectator Sports							
Playgrounds, Neighborhood Parks							
Golf Courses, Riding Stables, Water Recreation, Cemeteries							
Office Buildings, Business Commercial and Professional							
Industrial, Manufacturing, Utilities, Agriculture							

Normally Acceptable: Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.

Conditionally Acceptable: New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features are included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning will normally suffice.

Normally Unacceptable: New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design.

Clearly Unacceptable: New construction or development generally should not be undertaken.

Source: California Governor's Office of Planning and Research 2003

Regional and Local Plans, Policies, Regulations, and Ordinances

Santa Clara County and each of the cities within the county have established policies and guidelines that aim to minimize the effects of noise on people through prescriptive construction standards, zoning restrictions, hours of operation, and suppression techniques. Noise level goals are defined that are assumed to be compatible with various land use types within each jurisdiction. However, all jurisdictions recognize that higher than standard noise levels will be generated from time to time by heavy equipment engaged in construction or maintenance activities. Because heavy-equipment noise is an unavoidable necessity particularly for public works projects, jurisdictions typically include wording in noise ordinances and elements exempting these short-term, temporary, higher noise levels from compliance with the overall standards for land uses. Noise standards and policies established by Santa Clara County and incorporated cities within the Project Area are summarized in Table 3.9-4 and further detailed in Appendix D.

Table 3.9-4. General Plan and Noise Ordinance Standards

Jurisdiction	Specific Noise Criteria
Santa Clara County	Operation of tools or construction equipment on weekdays and Saturdays not allowed between the hours of 7 p.m. and 7a.m. No operation allowed on Sundays or holidays except for emergency work. Mobile equipment must not result in a noise level in excess of 75dBA for single/two-family residential (SFR), 80dBA for multi-family residential (MFR), or 85 dBA for commercial areas.
City of Campbell	Powered equipment is limited to the hours of 8 a.m. and 7 p.m. Monday through Friday and between the hours of 9 a.m. and 6 p.m. Saturday, Sunday, and on national holidays. However, noise from public works and maintenance construction projects may be exempted by the city manager.
City of Cupertino	Construction activities are limited to daytime hours (7 a.m. to 8 p.m. Monday through Friday, and 9 a.m. and 6 p.m. Saturdays and Sundays). High-quality noise muffler and abatement devices must be installed and in good condition on all construction equipment, and no single device may produce a noise in excess of 87 dBA at a distance of 25 feet OR noise levels at nearby properties must not exceed 80 dBA. However, special exemptions may be granted by the noise control officer, which would include notification to nearby properties.
City of Gilroy	Construction equipment may only be operated between the hours of 7:00 a.m. and 7:00 p.m. Monday through Friday and 9:00 a.m. and 7:00 p.m. on Saturday. No construction work is permitted on Sunday or city holidays. Exceptions may be granted by the chief building official.
City of Los Altos	Construction activities limited to the hours between 7:00 a.m. and 5:30 p.m. Monday through Friday and between 9:00 a.m. and 3:00 p.m. on Saturday in residential areas. In non-residential areas, construction can occur between 7:00 a.m. and 7:00 p.m. Monday through Friday and between 9:00 a.m. and 6:00 p.m. on Saturday. No construction work is permitted on Sunday or city holidays. Equipment may not be operated on holidays. Maximum permissible noise levels during daytime operation is 75 dBA for R1 zones, 80 dBA for PCF and R3 zones, and 85 dBA for OA and C zones.

Table 3.9-4. General Plan and Noise Ordinance Standards

Jurisdiction	Specific Noise Criteria
Town of Los Altos Hills	Construction near residential areas is limited to the hours of 8:00 a.m. to 5:30 p.m. Monday through Friday. Construction is not permitted on Saturdays without a permit, and no construction is permitted on Sundays or public holidays.
Town of Los Gatos	Construction activities are limited to 8 a.m. to 8 p.m. on weekdays and 9 a.m. to 7 p.m. on weekends and holidays. No single device may produce a noise in excess of 85 dBA at a distance of 25 feet and the noise levels at nearby properties must not exceed 85 dBA. Use of powered equipment is not time-limited in commercial, industrial, or public spaces.
City of Milpitas	Noise associated with SMP exempted from noise ordinance as maintenance of utility facilities.
City of Monte Sereno	Construction activities are generally limited to 8 a.m. to 8 p.m. on weekdays and 9 a.m. to 5 p.m. on Saturdays. Construction is not permitted on Sundays/public holidays. However, work not requiring a permit from the city is exempted from the time restrictions.
City of Morgan Hill	Construction activities are generally limited to 7 a.m. to 8 p.m. on weekdays and 9 a.m. to 6 p.m. on Saturdays. Construction is not permitted on Sundays or public holidays. However, public work activities are exempted from the time restrictions.
City of Mountain View	Construction activities are limited to 7 a.m. to 6 p.m. on weekdays. No work is permitted on weekends or holidays without prior approval.
City of Palo Alto	Construction activities on non-residential areas are limited to the hours of 8 a.m. to 6 p.m. on weekdays and 9 a.m. to 8 p.m. on Saturdays. Construction is not permitted on Sundays or public holidays. No single piece of equipment may produce a noise level in excess of 110 dBA at 25 feet, nor may noise level at any point outside of the property plane exceed 110 dBA. A sign must be posted at the entrance of the construction site indicating construction hours and violation penalties.
City of San Jose	Construction occurring within 500 feet of a residential unit is limited to the hours of 7 a.m. to 7 p.m. on weekdays. However, these time restrictions are limited only to construction activities requiring a permit from the city.
City of Saratoga	Construction activities permitted only between the hours of 7:30 a.m. and 6:00 p.m. on weekdays and between 9 a.m. to 5 p.m. on Saturdays in residential areas. No construction is permitted on holidays and on weekends in commercial areas. No individual piece of equipment may exceed a noise level of 83 dBA at a distance of 25 feet.
City of Santa Clara	Construction occurring within 300 feet of a residential area is generally limited to the hours of 7 a.m. to 6 p.m. on weekdays and 9 a.m. to 6 p.m. on Saturdays. Construction is not permitted on Sundays or holidays.
City of Sunnyvale	Construction activities permitted only between the hours of 7 a.m. and 6 p.m. on weekdays and between 8 a.m. to 5 p.m. on Saturdays. Construction is not permitted on Sundays or on national holidays.

Source: Data compiled by Horizon Water and Environment in 2011

3.9.3 Environmental Setting

Within the Project Area, background noise levels vary greatly from very low noise levels in the semi-rural western and eastern foothills to high noise levels in the urbanized Santa Clara Valley floor. Approximately 38 percent of the total creek miles within the Project Area flow through urban (residential, commercial, and industrial) areas and approximately 46 percent of creek miles within the Project Area flow through parkland or agricultural (open space) areas. Open space, agricultural, and recreational areas are anticipated to have fewer noise conflicts with proposed maintenance activities because relatively fewer sensitive receptors would exist. Approximately 73 percent of the total miles of creeks in the Pajaro River Basin are adjacent to natural open space and agricultural lands, compared with 34 percent of the total miles of creeks in the Santa Clara Basin.

The highest noise levels in the Project Area are in the vicinity of the San Jose International Airport. The noise environments of the north and central portions of Santa Clara Valley are heavily influenced by airplane takeoffs and landings. Noise monitoring conducted around the airport indicates that noise levels from aircraft alone exceed 65 dBA (CNEL).

Noise Sensitive Land Uses

Many of the streams maintained under the Proposed Project would be located in the vicinity of noise sensitive land uses. Given the extent of the Project Area, it is not plausible to identify the specific characteristics of every location that may be affected by the Proposed Project; however a brief synopsis of noise sensitive areas is provided below.

Recreational Areas

Some public parks and trails are located adjacent to areas where Proposed Project activities could occur. Some portions of recreational streamside trails are not as populated as other areas, and are located on the outskirts of urban areas. In less frequented trail reaches, it is possible for one person to travel for long periods of time without seeing other people. Ambient noise levels in this situation are predominantly characterized by the sounds of the natural environment. Conversely, many public parks and trails within the Project Area are located in urban and residential areas. During the summertime and particularly on weekends, congested conditions along streamside trails and parks are commonplace. In these areas, ambient noise reflects these human activities and may fluctuate seasonally.

Residential Areas

Proposed Project activities may take place adjacent to residential neighborhoods and homes. Residents in less-developed areas are potentially the most sensitive noise receptors within urban areas, as noise from adjacent waterway activities may be the only significant noise sources generated by human activity that affect these properties. Unlike recreational land uses, which are made up of transient user groups, residences are permanent dwellings. Thus, residents would be unable to avoid noise from adjacent land uses and would be exposed to them for longer periods of time.

The degree to which sound reaches residents from adjacent areas would depend on the type of activity being conducted, the distance from the noise source to the residence, and the

materials from which the home was constructed. Though the county and some cities impose a minimum building setback from waterways to protect life and property, residences may still be subject to loud or continuous noise from users of these waterways.

Other Areas

Noise sensitive land uses identified in the California Government Code include residences, recreation areas, schools, hospitals, nursing homes, churches, libraries, and long-term medical or mental care facilities. In addition to recreational and residential areas, Proposed Project activities may occur near any of these other sensitive land uses. As described above, the degree to which sound would reach these sensitive users would be dependent on a variety of factors. Seniors and others residing at hospitals, nursing homes, or long-term medical or mental care facilities would be anticipated to have longer noise exposure periods (similar to those in residential areas) because they would generally be unable to avoid noises from adjacent land uses. Schools, churches, or libraries would be used for shorter periods of time and may have noise exposure periods of shorter duration.

Land uses sensitive to noise generation are primarily those with an outdoor use component that includes an expectation of increased noise levels. Examples of sensitive land uses include backyards and gardens in residential areas, parks and open space reserves, outdoor shopping areas, and schoolyards and cemeteries. In these areas, excessive noise levels are a nuisance to people using outdoor facilities. Noise levels can normally be reduced for interior spaces through the use of modern construction techniques. Interior noise levels inside residences adjacent to creeks are typically less than 45 dBA CNEL with the windows closed because of the noise attenuation provided by walls and windows. However, outdoor areas cannot be easily shielded from high noise levels without the construction of noise barriers. In the Project Area, channels with a large extent (more than 3 miles) of adjacent residential land use are found in Adobe, Canoas, Matadero, Los Gatos, Permanente, Ross, San Francisquito, Lower Silver, Stevens, San Tomas Aquino, Saratoga, Sunnyvale East Channel, and Wildcat creeks, and the Guadalupe River.

3.9.4 Impact Analysis

Methodology

Impacts related to noise from the Proposed Project were analyzed quantitatively using noise sound levels measured in SCVWD's 2002 SMP EIR, for the various construction equipment and vehicles associated with proposed maintenance activities.

Data collected from the 2002 SMP EIR (Santa Clara Valley Water District 2002) were used to estimate noise exposure levels to sensitive receptors at a distance of 100 feet from the construction site. This data was used because noise generated by maintenance equipment is not believed to have changed substantially in the last 10 years. Contrarily, equipment may now be quieter and, as such, using the 2002 data provides a conservative analysis. To predict the noise levels at different distances, the methodology used in the 2002 SMP EIR treated the Proposed Project equipment as a point or stationary noise source and calculated noise levels based on the assumption that noise spreads out uniformly in waves from a source and attenuates (decrease in force and magnitude as it spreads) at a given rate per distance doubled. Noise attenuation from a point source was estimated based on the

presence of "soft" non-reflective ground and intervening vegetation between the noise source and the receptor. Thus, the attenuation rate was estimated at 9dB for each doubling of distance, with further increases in attenuation because of air absorption over distances greater than 1,000 feet. Table 3.9-5 illustrates the noise level estimates from typical maintenance activity equipment:

Table 3.9-5: Typical Noise Associated with SMP Activities

Noise source	dBA at 100 feet	dBA at 50 feet
Excavator working from top of bank	67	76
Chainsaw	75	84
Mowers/ spray trucks/ weed-eaters	65-70	74-79
Excavator and truck working concurrently (bank stabilization-type projects)	68-73	74-79

Source: SCVWD 2002

Any noise generated by proposed maintenance activities would be temporary. Typical maintenance activities would be short term, expected to last up to 10 days for sediment removal (although in certain cases they could last for several weeks or longer), and 8 days for bank stabilization. Vegetation management activities would be conducted on an ongoing basis, but would typically not occur in any given location for longer than a few days.

Criteria for Determining Significance

For the purposes of this analysis, the Proposed Project would result in a significant impact on noise if it would:

A. expose persons to or would generate noise levels in excess of standards established in the local general plans or noise ordinances, or applicable standards of other agencies;

B. expose persons to or generate excessive vibration or groundborne noise levels; or

C. result in a substantial temporary or permanent increase in ambient noise levels in the project vicinity above levels existing without the project

Noise levels associated with the Proposed Project were compared against local noise ordinance standards presented in Section 3.9.2, *Regulatory Setting* and summarized in Table 3.9-4. All Proposed Project-related noise would be temporary in nature; therefore, permanent noise impacts are not discussed further.

Environmental Impacts

Impact NZ-1: Temporary Exposure of the Public to Noise Levels in Excess of City or County Standards (Significance Criterion A; Significant and Unavoidable)

SMP Update activities typically would involve the use of heavy machinery and equipment, such as bulldozers, excavators, dump trucks, gradalls (hydraulic, wheel-mounted backhoes often used with wide buckets for dressing earth slopes), tractor mowers, and hand-held devices (chainsaws, hand sprayers) that may expose the public to noise. Stream maintenance would occur on weekdays. In rare instances, work could be conducted on weekends; for instance, if the work window was about to end and SCVWD had to complete winterization of a site. As a standard operating procedure, the District would use sound barriers around stationary generators when working near homes, to decrease the noise because this equipment typically runs 24 hours a day. A greater description of the potential noise effects from the various primary SMP Update activities is provided next.

Sediment Removal and Reuse/Disposal

Heavy equipment would be operated from either the top of a bank, if accessible, or within a channel or canal during sediment removal activities. When working within a channel or canal, the slopes generally would serve as a noise barrier for sensitive receptors. Adjacent receptors would be somewhat less shielded from heavy equipment when operations occurred on the top of a bank; thus, the noise associated with work at this upper location would represent a more conservative estimation of effects.

As described in the 2002 SMP EIR, monitoring of a SCVWD excavator sited on the top of the bank and removing sediment from Lower Penitencia Creek channel recorded an Leq of approximately 67 dBA at 100 feet. Based on standard attenuation estimates, an excavator working 50 feet from a residential backyard with soft ground and intervening vegetation would generate 76 dBA. The SCVWD estimates that on average, sediment removal projects progress at a rate of 200-400 feet of creek channel per day. Therefore, a typical subdivision lot (60 feet wide) located 50 feet from the operating equipment would be subject to 73 dBA for 1 to 2 hours during sediment removal operations. As the equipment moved further along the channel, noise levels would attenuate until equivalent to the background noise levels and would no longer be perceptible. (SCVWD 2001)

Sediment reuse/disposal would involve similar types of equipment and would be anticipated to have similar impacts as those described above.

Vegetation Management

Of the proposed vegetation management methods, hand removal (including the use of chain saws and weed eaters) and mechanical removal (including mowing and discing) would have the highest potential to create elevated noise levels. Although chain saws produce noise levels of approximately 75 dBA at 100 feet (SCVWD 2002), this type of equipment would be used infrequently and only for short periods of time. Noise levels associated with equipment used in more moderate durations (such as weed-eaters, mowers, and herbicide spray trucks) are commonly in the range of 65-70 dBA at 100 feet (SCVWD 2002). The use of animals for grazing would only be conducted where permitted by local ordinances and

policies, including noise ordinances, and this is not expected to be a significant source of noise.

Bank Stabilization

Noise levels associated with typical bank protection activities were analyzed in the 2002 SMP EIR. According to the data, noise levels ranged from 68 to 73 dBA at 100 feet with both a truck and excavator working concurrently. Based on standard attenuation, noise levels within 50 feet of working equipment are approximately 74 to 79 dBA. Depending on site-specific conditions of the Proposed Project activity, the SCVWD estimates that the range of progression for bank protection work typically would be between 20 to 40 feet per day. Therefore, the standard residential lot (60 feet wide) located within 50 feet of bank protection activities could experience noise levels up to 79 dBA over 3 to 10 hours (depending on the difficulty of the activity). Although the Proposed Project would incorporate several new methods of bank repair, potential noise effects associated with implementation are anticipated to remain the same.

Management of Animal Conflicts and Minor Maintenance

As described in Chapter 2, *Project Description*, these proposed maintenance activities would occur as needed and would not be projected activities. Management of animal conflicts would involve trapping or baiting to remove unwanted species (e.g., ground squirrels), or other means of control to discourage unwanted behavior. Such methods are not expected to be a significant source of noise to adjacent receptors. Similarly, the majority of minor maintenance activities are not considered significant sources of noise (i.e., trash and debris removal, fence repair, graffiti removal, and obstruction removal). On occasion, machinery may be required to remove in-channel sediment or debris, or grade maintenance roads; however, such actions would be relatively small in scale and shorter in duration than identified for the activities above. As such, noise emissions from heavy equipment associated with minor maintenance would be similar to that described for sediment removal activities; however, the overall duration and extent of use would be substantially less.

Canal Maintenance

Because routine canal maintenance activities would include all general work activities, effects would be the same as described above for other routine maintenance work.

Applicable Best Management Practices

The following BMPs would be implemented as part of the SMP Update to minimize temporary exposure of the public to noise levels in excess of city or county standards. Descriptions of each BMP are provided in Chapter 2, *Project Description*.

BMP GEN-36: Public Outreach
BMP GEN-38: Minimize Noise Disturbances to Residential Areas

Conclusion

Maintenance work under the Proposed Project would be a transient activity, and permanent changes in the existing noise environment would not result. Instead, effects would be analogous to construction-type noise, the significance of which would be determined by applicable construction-noise related policies and its potential to disturb adjacent receptors. In general, bank stabilization work would result in the greatest noise generation, though this type of work usually would occur in varied locations over the period of the Proposed Project. Other work activities (sediment removal and vegetation removal) may repeat two or three times in the same location over the 10-year SMP Update. Although in general, activities in the Proposed Project would represent a continuation of activities undertaken by SCVWD since implementation of the 2002 SMP EIR, the Proposed Project also would include work areas that were not projected in 2002 and where maintenance would not have been done in the recent past. However, the types and relative distances of sensitive receptors to SCVWD facilities would not differ substantially throughout the Project Area, and estimated noise levels associated with activities would be substantially similar for all locations.

Based on the noise estimations and the close proximity of adjacent property boundaries to SCVWD facilities (some less than 50 feet), stream maintenance activities could increase ambient noise levels by 3 dB or more (a noticeable increase), and/or result in exterior noise levels in excess of 75 dBA. These increases would be considered potentially significant in the context of the adopted noise policies within the Project Area, even though they would be temporary and, in some cases, conducted at the request of a homeowner, and even though this work would be exempted from the standards in some jurisdictions (Table 3.9-4). Overall, this impact would be significant. With the implementation of the above BMPs, the Proposed Project would minimize noise disturbances to residential areas but would still exceed several adopted ordinances in the Project Area. Additional mitigation, such as use of hay bales as temporary sound barriers, would not be considered feasible, as they would block access along many of the access roads and impede movement of maintenance equipment. No feasible mitigation is available to further reduce the significant and unavoidable impact associated with temporary noise impacts from SMP Update activities to a less-than-significant level. Therefore, Impact NZ-1 would remain significant and unavoidable.

Mitigation Measures: No mitigation is feasible.

Impact NZ-2: Generate Groundborne Vibrations (Significance Criterion B; No Impact)

The Proposed Project would not utilize heavy equipment that would generate groundborne vibration and affect local residents.

Bank Stabilization/Sediment Removal

Bank stabilization and sediment removal activities typically would involve the use of heavy machinery and equipment, such as bulldozers, excavators, dump trucks, gradalls, and tractor mowers. These activities would not require the use of any vibration-generating equipment, such as pile drivers. Any groundborne vibration associated with heavy

equipment would be very minor and localized, and this activity would have no impact on the surrounding land uses.

Other Maintenance Activities

All other SMP Update activities may require the use of heavy equipment similar to that utilized for the bank stabilization/sediment removal activities, and the effects of this equipment use would be similar to that described for bank stabilization/sediment removal.

Conclusion

The Proposed Project would not involve pile driving or other activities that would produce substantial groundborne vibrations. No impact would occur, and no mitigation would be required.

Mitigation Measures: No mitigation is required.

Impact NZ-3: Temporary Substantial Increase in Noise above Ambient Levels (Significance Criterion C; Significant and Unavoidable)

Temporary use of heavy equipment (e.g., bulldozers, dumptrucks) for the Proposed Project could result in noise levels greater than ambient conditions. As a standard operating procedure, the District would use sound barriers around stationary generators when working near homes, to decrease the noise because this equipment typically runs 24 hours a day.

Bank Stabilization/Sediment Removal

Bank stabilization and sediment removal activities would involve the use of heavy equipment that would result in increases in the ambient noise levels, as discussed under Impact NZ-1. The anticipated noise levels could increase by 3dB or more above the ambient level near the maintenance site, which would represent a noticeable increase in noise. However, these increases would be of short duration and infrequent, and typically would last from 1 day to up to 10 days for sediment removal activities at any given location. However, in some instances, sediment removal activities could persist for a longer duration at a given location (e.g., up to 6 weeks in limited cases).

Other Maintenance Activities

Other SMP Update activities (vegetation management, management of animal conflicts, minor maintenance, and canal maintenance) also could require the use of heavy equipment or hand-held equipment that would generate temporary increases in the ambient noise levels, resulting in similar impacts as described previously for bank stabilization and sediment removal. The duration of these activities also would be short-term and would be expected to last less than the duration of bank stabilization and sediment removal activities.

Applicable Best Management Practices

The following BMPs would be implemented as part of SMP Update activities to keep temporary substantial increases in noise above ambient levels to a minimum. Descriptions of each BMP are provided in Chapter 2, *Project Description*.

BMP GEN-36: Public Outreach
BMP GEN-38: Minimize Noise Disturbances to Residential Areas

Conclusion

Because the Proposed Project would include noise-reducing measures and the notification of maintenance activities to residences, businesses, or other sensitive receptors, and noise generated in any one location would be short-term, this impact would generally be less than significant and no mitigation would be required. However, in some cases, these temporary impacts would persist for a longer period at a given location (e.g., sediment removal activities lasting longer than 3 weeks). In these cases, this impact would be considered significant. As described under Impact NZ-1, mitigation such as temporary sound barriers would be infeasible. Thus, this impact would be significant and unavoidable.

Mitigation Measures: No mitigation is feasible.

Chapter 3.10

PUBLIC SERVICES AND UTILITIES

3.10 Public Services and Utilities

3.10.1 Introduction

This section describes the regulatory setting, environmental setting, and potential impacts of the Proposed Project related to public services and utilities. These public services and utilities include police and fire services, emergency services, schools, solid waste, and underground and overhead utilities. The Proposed Project would not have any effect on water supply or wastewater demands or capacity; therefore, they are not discussed further in this section. Potential impacts associated with SMP Update maintenance activities on parks and other recreational areas available for public use are discussed in Section 3.11, *Recreation*.

Data used in the preparation of this section were primarily gathered from Santa Clara County, the City of San Jose, and the California Department of Resources Recycling and Recovery (CalRecycle).

3.10.2 Regulatory Setting

Federal Plans, Policies, Regulations, and Laws

No federal plans, policies, regulations, or laws related to public services and utilities are applicable to the Proposed Project.

State Plans, Policies, Regulations, and Laws

The only state regulations pertinent to public services and utilities pertain to the management of solid waste.

California Integrated Waste Management Act

To conserve water, energy and other natural resources, and to protect the environment by reducing the incineration or landfill disposal of waste, the California Integrated Waste Management Act of 1989 requires cities and counties to reduce, reuse, and recycle (including composting) solid waste generated in the state to the maximum extent feasible. The Act requires development of countywide integrated waste management plans (CIWMP). The CIWMP must include source reduction and recycling elements, household hazardous waste elements, and non-disposal facility elements for the county and each city within the county.

The California Integrated Waste Management Act is overseen by the California Integrated Waste Management Board (CIWMB) and managed by CalRecycle. CalRecycle oversees partnerships with local governments, industries, and the public to reduce waste, decrease greenhouse gas emissions, promote the highest and best use of materials, and regulate the handling, processing, and disposal of solid waste.

The CIWMB's 2001 Strategic Plan (CIWMB 2001) included a goal of a "zero-waste" California, and strategic directives were established in 2007 to incorporate efforts to implement the California Global Warming Solutions Act of 2006.

Regional and Local Plans, Policies, Regulations, and Ordinances

Santa Clara County Integrated Waste Management Plan

The Santa Clara County CIWMP was completed and approved by the CIWMB in 1996. Each of the jurisdictions (cities and towns) in the county has completed implementation of the requirements of the CIWMP.

The jurisdictions and the County established the following countywide policies for reducing waste and implementing the programs identified in the CIWMP:

1. Similar programs selected by neighboring jurisdictions should be combined when and if this will result in the achievement of economies of scale in capitalizing and operating programs, and as long as such consolidation does not conflict with the interests of the jurisdictions.

2. The cities of the county will work together to ensure that new disposal and non-disposal facilities are appropriately sized, designed, and sited, in order to avoid duplication of effort, unnecessary expenditure of funds, and environmental degradation, and so that the specific integrated waste management needs of each jurisdiction are met.

3. In order to avoid confusion and duplication of effort, the Solid Waste Commission of Santa Clara County, advised by the Technical Advisory Committee, shall coordinate and oversee implementation of new countywide integrated waste management programs, administer programs selected for countywide implementation, and address issues of regional or countywide concern, as these arise. State and local legislation dealing with integrated waste management issues affecting Santa Clara County shall be monitored and countywide compliance with State and Federal requirements shall be encouraged.

As of 2000, the County and all jurisdictional cities successfully diverted and continue to divert 50 percent or more of the waste stream from landfill disposal.

Santa Clara County Zero Waste 2020 Vision

Santa Clara County developed the "Zero Waste 2020 Vision" to encourage local governments to adopt policies and develop plans that motivate community members to eliminate waste. This vision statement and action plan were developed to provide Santa Clara County jurisdictions with a working document that can be used to guide decision making policies and programs toward achieving zero waste by 2020. (Santa Clara County Integrated Waste Management Division 2010)

Santa Clara County's vision is that by 2020, all discarded materials in the county will be recovered for their highest and best use, and no materials will be sent to landfills or incinerators.

As stated in the vision statement, Santa Clara County is working to:

1. Educate and engage businesses, organizations, public agencies and residents.
2. Adopt and implement supporting policies and Zero Waste Action Plans.
3. Support legislation and adopt policies that require minimizing environmental impacts through improved product design.
4. Ensure that facilities and infrastructure are in place to properly manage all recovered materials.

Implementation of Zero Waste 2020 Vision actions to achieve the County's mission is based on the following guiding principle regarding recycling and composting:

1. Recycling and Composting: Manage Materials to Minimize Environmental Impacts Downstream
    1. All organic materials shall be recovered and productively used.
    2. Recovered materials shall be directed to their highest and best use.
    3. Materials sent to landfill shall be minimized.

Cities throughout the county have developed and are implementing Zero Waste plans, following the County's guidance. For example, the City of San Jose adopted a Zero Waste Strategic Plan in 2008 (City of San Jose 2008). More information on the specific zero waste plans for each of the cities and towns within the County are available through their respective Web sites.

3.10.3 Environmental Setting

Police and Fire Services

Law enforcement and public safety services in the Project Area are provided by a combination of County and City departments. The Santa Clara County Sheriff's Department employs over 1,400 staff and is the primary law enforcement agency in unincorporated areas of the County and the communities of Cupertino, Los Altos Hills, and Saratoga. The County Sheriff's Department also provides law enforcement services for the Valley Transportation Authority and the Santa Clara County Parks Department (Santa Clara County Sheriff's Department 2010). Incorporated cities, such as San Jose, Gilroy, and Mountain View, operate independent police departments, which enforce local, state, and federal laws within their city limits. The California Highway Patrol also lends law enforcement and emergency assistance in the Project Area.

The Santa Clara County Fire Department provides fire, safety, and hazardous materials services for the County and the communities of Campbell, Cupertino, Los Altos, Los Altos Hills, Los Gatos, Monte Sereno, Morgan Hill, Saratoga, and unincorporated county areas. The County operates 16 fire stations, 100 emergency response vehicles, and employs over 265 fire prevention, suppression, investigation, administration, and maintenance personnel (Santa Clara County Fire Department 2010.) Other incorporated cities within the County, such as San Jose, Mountain View, and Santa Clara, operate independent fire departments.

Schools

In Santa Clara County, 36 school districts and 347 public schools provide educational services to over 261,000 students (Santa Clara County Office of Education 2010). All of these schools are in session during a traditional school calendar, starting in August and ending in May or June, and some are open year-round. Therefore, children may be present during SMP Update activities implemented near schools.

Solid Waste

Five permitted and active Class III landfills are located in Santa Clara County. The current status of each to receive waste materials is shown in Table 3.10-1. The current status of landfills permitted to receive hazardous waste is discussed in Section 3.6, *Hazards and Hazardous Materials*.

Table 3.10-1: Status of Landfills in Santa Clara County

Landfill	**Maximum Permitted Throughput** (tons per day)	**Maximum Permitted Capacity** (cubic yards)	**Remaining Capacity** (cubic yards)	**Estimated Closure Date** (when maximum capacity may be reached)
Newby Island Sanitary Landfill (43-AN-0003-01)	4,000	50,800,000	18,274,953	June 2025
Kirby Canyon Recycling and Disposal Facility (43-AN-0008-01)	2,600	36,400,000	57,271,507	December 2022
Guadalupe Sanitary Landfill (43-AN-0015-01)	1,300	28,600,000	14,600,000	November 2025
Zanker Road Class III Landfill (43-AN-0007-01)	1,300	1,300,000	700,000	Not available
Zanker Material Processing Facility (43-AN-0001-01)	350	540,100	540,100	December 2018

Source: CalRecycle 2010

Underground and Overhead Utilities

Underground and overhead utilities in the Project Area include natural gas, water, and oil pipelines (including raw water and treated water pipelines owned by SCVWD), sewer and storm drains, and communication lines (i.e., telephone, cable, power, and Internet services). If not visibly apparent, the location of these lines within work sites can be obtained through coordination within SCVWD, with County and municipal utility departments, and with the managing utility company.

3.10.4 Impact Analysis

Methodology

Impacts of the Proposed Project were evaluated qualitatively, based on the potential for the proposed maintenance activities to disrupt existing public services and utilities systems. These activities were identified and evaluated as temporary, short-term impacts; no long-term impacts of the Proposed Project on public services and utilities were identified.

Criteria for Determining Significance

For the purposes of this analysis, the Proposed Project would result in a significant impact on public services and utilities if it would:

A. result in the need for additional, or physically altered, public services or facilities, the provision of which could cause significant environmental impacts, to maintain acceptable service ratios, response times, or other performance objectives for any public service: fire protection, police protection, schools, parks, or other public facilities;

B. result in a need for new, relocated, upgraded, or expanded utilities and service system facilities that could cause significant environmental impacts to maintain acceptable service levels or other performance objectives for: water, wastewater/reclaimed water, stormwater, solid waste, streets and roadways, power systems (e.g., electricity, natural gas), other utility systems;

C. have insufficient water supplies available to serve the project from existing entitlements;

D. be served by a landfill with insufficient permitted capacity to accommodate the Proposed Project's solid waste disposal needs; or

E. fail to comply with federal, state, and local statues and regulation related to solid waste.

Environmental Impacts

Impact PSU-1: Effects on Public Facilities and Services (Significance Criterion A, Less than Significant)

The Proposed Project would not involve the construction of any development or involve any long-term activities that would result in an increased demand for public facilities, such as police, fire, or schools. The proposed maintenance activities would have no effect on the potential need for school facilities or services. However, the Proposed Project may have short-term effects on fire or police services during maintenance activities, as described below.

Vegetation Maintenance

Vegetation maintenance activities may include the use of flamers that, if used improperly, could result in an increased risk of starting a wildfire and the subsequent need for fire protection services. The Proposed Project includes BMPs that would dictate for flamers to be used cautiously by trained personnel and only during appropriate weather and seasonal conditions. As described in Section 3.6, *Hazards and Hazardous Materials*, the potential risk of starting a wildfire would be less than significant. In addition, the removal of debris and excess vegetation may actually reduce the potential for a wildfire and the need for fire protection services.

Vehicles and equipment associated with the proposed vegetation management activities, including the mechanical removal of trees, could require temporary local lane or road closures. In addition, these activities could generate additional management-related traffic. Although temporary, these closures and additional traffic could potentially impact the emergency response times of police or fire services during the maintenance activities.

Bank Stabilization, Sediment Removal, and Minor Maintenance

Bank stabilization and sediment removal activities would require the use of and/or temporary storage of heavy equipment, vehicles, sediments, and other materials. Minor maintenance also may require the use of heavy equipment (e.g., for grading activities) and/or storage of materials (e.g., plants and other landscaping materials). Similar to the vegetation management activities, these activities may require temporary lane or road closures of adjacent roads and may generate additional project-related traffic, resulting in temporary potential impacts on emergency response times.

Management of Animal Conflicts

Management of animal conflicts, particularly physical alteration activities such as surface compaction of levee surfaces or reconstruction of levee side slopes, also may require potential closures of adjacent roads. These closures could temporarily affect emergency response times.

Canal Maintenance

Because routine canal maintenance activities would include all general work activities, effects would be the same as described above for other routine maintenance work.

Applicable Best Management Practices

The following BMPs would be implemented as part of the SMP Update to prevent maintenance activities from resulting in significant effects on public facilities and services. Descriptions of each BMP are provided in Chapter 2, *Project Description*.

BMP GEN-36: Public Outreach
BMP GEN-37: Implement Public Safety Measures
BMP GEN-39: Planning for Pedestrians, Traffic Flow, and Safety Measures

Conclusion

The impact on public facilities and services resulting from the Proposed Project would be less than significant and would not require mitigation.

Mitigation Measures: No mitigation is required.

Impact PSU-2: Disruption to Utilities and Service System Facilities (Significance Criterion B, Less than Significant)

Buried and aboveground pipes, cables, or other utility delivery systems, for utilities including wastewater, stormwater, water, and power systems, are present within the Project Area. Stormwater pipelines and outfalls, in particular, commonly are located within or near stream channels and canals. Any of these utilities could potentially experience a disruption in service if the Proposed Project's maintenance activities accidentally damaged the utilities' distribution or transmission systems. In addition, the Proposed Project could potentially cause new environmental impacts if it would result in a need for new, relocated, upgraded, or expanded utilities and service system facilities. The Proposed Project's potential to affect utilities is further described below. The Proposed Project's potential to affect the acceptable service levels of streets and roadways is described in Section 3.12, *Traffic and Transportation*.

Vegetation Maintenance

Vegetation maintenance activities would have the potential to affect overhead utility lines during the removal or pruning of vegetation, particularly trees, and to potentially affect underlying utilities during discing activities. A beneficial impact of the vegetation maintenance activities would be vegetation removal from stream channels, which would restore the conveyance capacities of the channels during storm-flows. In addition, vegetation maintenance activities also would reduce fire hazards for adjacent properties.

Sediment Removal/Bank Stabilization Activities/Minor Maintenance

Grading, digging, and other ground-disturbing activities related to sediment removal, bank stabilization, and minor maintenance activities would potentially affect buried utilities that cross or are adjacent to Project Area water bodies. However, a beneficial effect of the sediment removal and minor maintenance activities would be the clearing of sediment or debris from stormwater outfalls and/or the replacement of these outfalls where needed.

Management of Animal Conflicts

Animal conflicts management would not be conducted in locations of underground utilities, and would be conducted without equipment that could interfere with any buried utilities. In particular, physical facility alterations, such as surface compaction of levees after filling of burrows, would avoid buried utilities at maintenance work sites.

Canal Maintenance

Because routine canal maintenance activities would include all general work activities, effects would be the same as described above for other routine maintenance work.

Applicable Best Management Practices

SCVWD would implement the following BMPs as part of the SMP Update to prevent maintenance activities from disrupting utilities and service system facilities. Descriptions of each BMP are provided in Chapter 2, *Project Description*.

BMP GEN-4: Minimize the Area of Disturbance
BMP GEN-23: Stream Access
BMP GEN-36: Public Outreach
BMP GEN-42: Investigation of Utility Line Locations

These BMPs would minimize the potential disturbed areas and the potential to affect buried utilities in part by utilizing existing access ramps and roads to the extent feasible. In addition, these BMPs would provide for all public works departments in the Project Area to be notified of the annual work plan and proposed maintenance locations, thereby giving the departments the opportunity to provide input regarding the locations of utilities near the maintenance work sites.

Conclusion

By implementing the BMPs listed above, the impact on utilities and service system facilities resulting from the Proposed Project would be less than significant and would not require mitigation.

Mitigation Measures: No mitigation is required.

Impact PSU-3: Insufficient Available Water Supplies resulting in the Need for New or Additional Water Supply or Distribution Facilities (Significance Criteria B and C, Less than Significant)

Potential construction-related impacts could result if new water distribution or supply facilities were needed to supply Proposed Project activities. The Proposed Project would require water for various maintenance activities, as described next.

Bank Stabilization Activities

Potential activities related to bank stabilization that may require water include vehicle cleaning, sediment/soil watering related to dust control activities, and irrigation of mitigation sites. As described in BMP GEN-31 (Chapter 2, *Project Description*), on-site vehicle cleaning may occur but only as needed to prevent the spread of sediment, pathogens, or exotic/invasive species. In addition, as detailed in BMP GEN-29, active maintenance areas and/or stockpiled soils would be watered following required dust control measures set by the Bay Area Air Quality Management District.

On-site mitigation may be performed, if necessary, as part of bank stabilization activities, depending on the results of each site's Mitigation Feasibility Assessment (MFA) (as described in the 2012 SMP Manual, Appendix A). Newly planted vegetation at the on-site mitigation sites may require irrigation until the plants became established. The amount of water needed for irrigation of these sites cannot be quantified at this time because bank stabilization activities are not projected activities and the MFAs would determine the specific vegetation types and quantities to be planted at each site. However, the MFAs would recommend planting species appropriate to the site conditions to minimize the use of natural resources (e.g., water). In general, SCVWD water trucks and supplies would be used to meet the limited water demands related to bank stabilization activities. Other methods of meeting water demands may include tie-ins to SCVWD water meters or, at irrigation sites with limited access, use of a technology that would release water to a plant's roots over an extended period of time. These activities would not require the construction of any long-term water distribution or supply facilities.

Sediment Removal Activities

Dust control-related watering and vehicle cleaning could be performed as part of sediment removal activities, similar to that described for bank stabilization.

Minor Maintenance Activities

Water may be used as part of minor maintenance activities for the irrigation of mitigation and landscaping sites, similar to the activities described for bank stabilization. In addition, watering may be performed to control dust occurring from any soils exposed during minor grading activities. The water quantity necessary for these activities would not require the construction of long-term water distribution or supply facilities.

Management of Animal Conflicts

Animal conflicts management generally would not result in any water demands. Limited water demands related to vehicle cleaning or dust control-related watering would result if any physical alterations of levee slopes, including surface compaction of levee slopes with heavy construction equipment, were performed.

Vegetation Management

Vegetation management activities (e.g., mowing, pruning, tree removals, or herbicide applications) generally would not result in any water demands. Flaming and grazing activities may require some water, to wet dry vegetation before and during flaming activities or to supply water for grazing animals. Both flaming and grazing are not projected activities under the Proposed Project. Discing for the Proposed Project may require the water for dust control. Because flaming and grazing activities are not projected and water for discing would be limited to dust control, these activities are anticipated to have limited water demands that would be met by trucked-in SCVWD water supplies.

Canal Maintenance

Because routine canal maintenance activities would include all general work activities, effects would be the same as described above for other routine maintenance work.

Applicable Best Management Practices

To minimize the potential water needed for dust-control, SCVWD would implement the following BMP as part of maintenance activities. A description of this BMP is provided in Chapter 2, *Project Description*.

BMP GEN-4: Minimize the Area of Disturbance

Conclusions

Proposed maintenance activities would require limited quantities of water for dust control, irrigation, or vehicle cleaning. Water demands would be met with SCVWD supplies and generally trucked into work sites, as necessary. Therefore, sufficient water supplies would be available for the Proposed Project. Thus, this impact would be less than significant and no mitigation would be required.

Mitigation Measures: No mitigation is required.

Impact PSU-4: Disposal of Excavated Sediment and Other Materials at Off-Site Locations, Including Landfills (Significance Criteria B, E, and F, Less than Significant)

Although the SCVWD does not have a projection for the volume of sediment and other materials (e.g., vegetation) to be removed under the SMP Update, historical data indicates that an average of 46,500 cubic yards of material was removed per year from 2002–2009 (Table 2-1). Furthermore, although the overall projected work area for sediment has increased since implementation of the 2002 SMP, sediment removal volumes would likely remain similar because the overall effort in terms of equipment and staff would not be significantly higher under the Proposed Project than the historic level of effort. Based on the historical trends, the Proposed Project likely would involve the removal of between 8,900 and 97,000 cubic yards of sediment (approximately 13,350 to 145,500 tons[1]) per year. In addition, the Proposed Project likely would involve the removal of approximately 11,378

[1] Estimate of tons is approximate and variable (basis for estimate is 1.5 tons per cubic yard). Sediment weight in a given volume is dependent on several factors including moisture content, particle size, and density.

tons per year of other materials. On average, 46,500 cubic yards (approximately 69,750 tons) of sediment and other materials was removed per year from 2002–2009.

The SCVWD would test samples from all material to be dredged to determine its appropriate reuse or disposal. As described in Section 3.13, Water Quality, sediments of sufficient quality could be used for wetland restoration projects; sediments of insufficient quality to be used for wetland restoration could be used as cover material at landfills (i.e., spread in layers over solid waste debris to contain gases and assist in the decomposition process). As described in Section 3.10.3, Environmental Setting, three landfills have closure dates near or within the time horizon of the SMP Update. Sediment that exceeded hazardous waste criteria would be disposed at sites designated to receive hazardous waste (e.g., Buttonwillow, a hazardous waste landfill).

Maintenance activities could generate up to 970,000 cubic yards of material waste over the 10-year lifetime of the Proposed Project. For sediment meeting the wetland reuse criteria, SCVWD has identified several wetland restoration areas that would be available to accept such sediment. Of these, Pond A8 has sufficient capacity for sediment reuse for the next 2–5 years. As described in Chapter 2, *Project Description*, additional ponds have been identified as potentially other suitable long-term sediment reuse locations. No other specific sites for the beneficial reuse of sediments for pond, upland, or aquatic restoration projects have been identified. For sediment that did not meet the wetland reuse criteria but was not considered hazardous, the SCVWD could dispose it at a local landfill, either to be disposed as waste or used for beneficial purposes (i.e., cover material). The overall capacities and daily/yearly constraints of existing landfills would be sufficient to serve the needs of the Proposed Project.

As described further in Section 3.6, Hazards and Hazardous Materials, three hazardous waste disposal sites are located in California: Chemical Waste Management's Kettleman Hills facility (Kettleman Hills); Clean Harbors' Buttonwillow facility (Buttonwillow); and Clean Harbors' Westmorland facility (Westmorland). These facilities would be capable of treating, storing, and/or disposing virtually all solid, semi-solid, and liquid hazardous, extremely hazardous, and non-hazardous wastes, including contaminated sediments and other materials. The Kettleman Hills hazardous waste landfill has a capacity of approximately 10.7 million cubic yards but could only accept very small quantities of hazardous waste (Brady, pers. comm., 2011) because it has nearly reached capacity. Buttonwillow, located west of Bakersfield, has a permitted capacity of 13,325,000 cubic yards and its constructed landfill capacity is 950,000 cubic yards. That facility would be capable of accepting large quantities of waste, including the amounts potentially generated by the Proposed Project (Winwood, pers. comm., 2011). The Westmorland facility, located near the Salton Sea, has a design capacity of 5,000,000 cubic yards (Clean Harbors 2010b). Sediment or materials classified as hazardous that would be excavated as part of the proposed maintenance activities likely would be disposed at Buttonwillow because it would have sufficient capacity and would be the second closest facility (after Kettleman Hills) to Santa Clara County. Sufficient capacity would be available at the three existing hazardous waste disposal sites to meet SCVWD's needs over the life of the Proposed Project.

Applicable Best Management Practices

The following BMPs would be implemented as part of the SMP Update so that the quantity of excavated or disturbed sediments, particularly hazardous sediments, would be minimized through the use of existing access ramps/roads, avoidance of hazardous sediments or sites, and minimization of the area of soils disturbed. Descriptions of each BMP are provided in Chapter 2, *Project Description*.

BMP GEN-3: Avoid Exposing Soils with High Mercury Levels
BMP GEN-4: Minimize the Area of Disturbance
BMP GEN-23: Stream Access
BMP GEN-27: Existing Hazardous Sites

Conclusion

Known disposal sites generally would be able to accommodate the volume of sediment and other materials generated by the Proposed Project. In addition, new disposal sites may be identified over time, which would provide additional disposal capacity. The Proposed Project would comply with state and local statutes applicable to solid waste by reusing sediments as much as possible, depending on the sediment quality. Therefore, this impact would be less than significant and no mitigation would be required.

Mitigation Measures: No mitigation is required.

Chapter 3.11

RECREATION

3.11 Recreation

3.11.1 Introduction

This section describes the environmental setting and potential impacts of the Proposed Project related to recreational resources.

3.11.2 Environmental Setting

With regards to current recreational resources in the Project Area, SCVWD has a policy to work with local jurisdictions and recreational users to allow public access to many SCVWD-owned facilities, including creek easements and reservoirs.

Creek-Side Trails

Access roads that parallel most proposed maintenance channels (and some canals) also may provide creek-side recreational access. Some of these access roads already are formalized as recreational trails, with signage and other amenities such as benches. Where accessible, these roads and trails are used for a variety of recreational activities, including walking, jogging, biking, dog walking, and bird watching. These trails provide an important recreational resource, particularly in the urban environments of San Jose. Creek-side trails typically are made of consolidated earth or gravel, or they are fully paved.

Santa Clara County Trails

Santa Clara County's regional park system has 28 regional parks that span approximately 45,000 acres. Numerous trails are located throughout these parks, providing views of the local mountains and Santa Clara Valley. The County administers approximately 300 miles of trails, of which approximately 35 miles are paved (Falkowski, pers. comm., 2010). In addition to funds received from SCVWD under the District's Trail and Open Space Grant Program, the County supports new trail development and construction from a variety of other funding sources.

City of San Jose Trails

In 2000, the City of San Jose implemented a trail program with a mission of constructing a 100-mile trail network along 32 trails, to enhance, strengthen, and connect neighborhoods. As of July 1, 2010, approximately 54 miles of 24 unique trails had been constructed. Many of the constructed (and planned) trails are located along and/or offer views of local streams. Constructed and planned trails along surface water bodies include, but are not limited to: the Guadalupe River trail and trails along Coyote, Fowler, Guadalupe, Los Gatos, Los Alamitos, Penitencia, Saratoga, Upper and Lower Silver, Silver Creek Valley, Thompson, Yerba Buena, Berryessa, Canoas, Fisher, and Calero creeks. A trail-use survey that was conducted on September 23, 2009, counted over 1,300 people utilizing the City's trails on that day. Trail usage increased approximately 9.6 percent from 2008 to 2010, and 51.2 percent of trail uses were for commuting or running errands. (City of San Jose 2010)

Some City trails have been funded through the SCVWD Trail and Open Space Grant Program, including funding granted in 2010, for the design and construction of 2,000 linear feet of trail along the Penitencia Creek Trail system (SCVWD 2011).

3.11.3 Impact Analysis

Methodology

This section describes the Proposed Project's potential impacts on recreation. Impacts were evaluated qualitatively, based on the potential for the Proposed Project to disrupt access to and use of existing recreational facilities. Generally, construction activities may result in a short-term loss of recreational opportunities by disrupting use of or access to recreation areas or facilities. A long-term effect could occur if a recreational opportunity was eliminated as a result of long-term maintenance activities.

Criteria for Determining Significance

For the purposed of this analysis, the Proposed Project would result in a significant impact on recreational resources if it would:

A. result in the loss or deterioration of available public recreational opportunities.

Environmental Impacts

Impact REC–1: Temporary Disturbance of Recreational Quality (Significance Criterion A; Less than Significant)

The Proposed Project could affect the recreational quality of local recreational areas if it created nuisance effects (i.e., air quality, noise, traffic, and aesthetics).

Sediment Removal/Bank Stabilization

Sediment removal and bank stabilization activities would involve the movement of heavy equipment, truck traffic, maintenance noise, and air emissions in the vicinity of recreational areas (mainly trails), which could affect recreational quality in the immediate vicinity of work sites. Maintenance projects would be short term and typically would be completed in approximately 10 days. Larger sediment removal projects may last up to 8 weeks. The nuisance effects of maintenance (i.e., air quality, noise, traffic, and aesthetics) are discussed here specifically as they relate to recreational quality, but they are addressed in more detail in the relevant resource sections of this chapter.

Although the location and quality of existing trails adjacent to SCVWD-maintained facilities vary throughout the County, the relative sensitivity of users and potential adverse effects associated with temporary maintenance activities are expected to be similar throughout the Project Area. Although temporary, maintenance-related nuisance effects associated with the implementation of the proposed activities could affect recreational resources by temporarily degrading the quality of the recreational experience in the vicinity of the work site.

Vegetation Management

Vegetation management activities could create similar temporary nuisances on recreational quality as those described above, related to the use of hand-held equipment and vehicles. Vegetation management activities would occur on an ongoing basis, but they typically would not occur in any one location for longer than a few days at a time. These activities could temporarily degrade the quality of the recreational experience in the vicinity of the work site.

Minor Maintenance

Minor maintenance activities may involve the use of heavy equipment for grading or sediment removal. Minor maintenance activities would last for a shorter period of time than sediment removal or bank stabilization activities, but because of the use of similar types of equipment, they would have similar temporary effects on the recreational quality.

Management of Animal Conflicts

Animal conflicts management generally would not be anticipated to generate substantial sources of noise that could affect recreational quality. However, these activities could utilize heavy equipment for the physical alteration of animal habitats. Potential effects on recreational quality related to the use of heavy equipment for management of animal conflicts would be similar to those described for bank stabilization/sediment removal activities.

Canal Maintenance

Because routine canal maintenance activities would include all general work activities, effects would be the same as described above for other routine maintenance work.

Applicable Best Management Practices

The following BMPs would be implemented as part of the SMP Update to prevent maintenance activities from substantially affecting the quality of recreational use. Descriptions of each BMP are provided in Chapter 2, *Project Description*.

BMP GEN-19: Work Site Housekeeping
BMP GEN-21: Staging and Stockpiling of Materials
BMP GEN-36: Public Outreach
BMP GEN-37: Implement Public Safety Measures
BMP GEN-38: Minimize Noise Disturbances to Residential Areas
BMP GEN-39: Planning for Pedestrians, Traffic Flow, and Safety Measures

Conclusion

By implementing these BMPs, general site cleanliness, noise control, and appropriate access and safety controls would be in place to minimize the potential temporary disturbance impact on recreational quality. This impact would be less than significant and no mitigation would be required.

Mitigation Measures: No mitigation is required.

Impact REC–2: Permanent Changes to Recreation Quality (Significance Criterion A; Beneficial)

The Proposed Project could permanently affect recreational quality if it resulted in adverse permanent impacts on the quality of recreational areas in the vicinity of proposed maintenance activities.

Vegetation Management

As discussed in Section 3.1, *Aesthetics*, vegetation management activities would have an overall long-term beneficial impact on visual quality in the Project Area. Vegetation management activities would keep vegetation from becoming overgrown, which could otherwise affect access to roads and trails. In addition, the on-site revegetation activities conducted as part of the Proposed Project would encourage the development of healthy riparian corridors with fewer nonnative and invasive species, and would create the appearance of a more "natural" stream corridor.

Sediment Removal and Bank Stabilization

Removal of sediment from SCVWD channels and facilities would remove silt, vegetation, and other blockages, which would allow the creek to function more naturally, resulting in a benefit to the recreational quality. Sediment reuse that improves ecological condition or functioning would be anticipated to have positive effects, to the extent that the reuse sites would support recreation. Stabilization and repair of eroding banks would reduce sediment loss and in-channel build-up. Although the use of certain materials (i.e., rock, riprap) to repair banks could appear visually different, on-site revegetation would minimize long-term visual impacts.

Minor Maintenance

Minor maintenance activities, including installation/maintenance of mitigation and landscape sites, debris removal, fence maintenance, and graffiti removal activities, would result in an improvement to the visual quality and character of SCVWD-maintained channels. Therefore, permanent effects on recreational quality from these activities would be beneficial.

Management of Animal Conflicts

Long-term effects of animal conflicts management could benefit the recreational quality of treated areas. By discouraging damage caused by animal activity (i.e., burrowing), the integrity of SCVWD facilities would be preserved and visual damage would be minimized. Therefore, management of animal conflicts under the Proposed Project would result in a beneficial impact.

Canal Maintenance

Because routine canal maintenance activities would include all general work activities, effects would be the same as described above for other routine maintenance work.

Applicable Best Management Practices

The following BMPs would be implemented as part of the SMP Update to prevent permanent changes to recreation quality. Descriptions of each BMP are provided in Chapter 2, *Project Description*.

BMP GEN-19: Work Site Housekeeping
BMP SED-3: Restore Channel Features
BMP REVEG-1: Seeding
BMP REVEG-2: Planting Material

Conclusion

By implementing these BMPs, good housekeeping practices would be followed at work sites and provide for revegetation activities to be implemented shortly after completing vegetation management, sediment removal, or bank stabilization activities that would remove vegetation. This impact would be beneficial and no impacts would occur.

Mitigation Measures: No mitigation is required.

Impact REC–3: Temporary Disruption of the Use of, or Access to, Recreational Facilities (Significance Criterion A; Less than Significant)

As described in Section 3.11.2, *Environmental Setting,* a number of channels and canals in the Project Area support public recreation (e.g., creekside trails). Sediment reuse sites also may support recreation, depending on their location. Users of public trails and associated recreational facilities could experience temporary disruptions during active maintenance activities.

Sediment Removal/Bank Stabilization

When sediment removal and bank stabilization activities are conducted, portions of nearby trails or trail parking areas may have to be temporarily closed for the duration of the maintenance activity (from less than a day to up to several weeks, in limited instances) to maximize public safety while they are used as access corridors or staging areas for vehicles, supplies, and equipment. Depending on the extent of area needed to conduct the activities,

such closures could temporarily impede recreational use. However, closures would be localized to a specific maintenance or sediment reuse site, and alternative recreational opportunities would continue to be available along other streamside trails and recreational facilities in the overall Project Area (e.g., city and county parks). Over the long term, the improvement to stream conditions would improve the quality of many of the trails as recreational amenities.

Vegetation Management

Upland activities for vegetation management, such as mowing or discing, maymay require temporary closure of portions or entire segments of creekside trails in the vicinity of work sites. In-channel vegetation management activities may result in temporary disruption of recreational facilities for use as access corridors or staging areas for vehicles, supplies, and equipment. Potential short-term effects on the recreational facilities would be similar to those described for sediment removal and bank stabilization activities.

Other Maintenance Activities

Minor maintenance activities could involve both upland activities (i.e., fence repairs), similar to that described for vegetation management, and in-channel activities (e.g., debris removal). Management of animal conflicts may require the temporary closure of areas for the application of fumigants, and physical alterations to habitats. Effects of minor maintenance and animal conflict management activities would be similar to those described for sediment removal, bank stabilization and vegetation management. Because routine canal maintenance activities would include all general work activities, effects would be the same as described above.

Applicable Best Management Practices

The following BMPs would be implemented as part of the SMP Update to address any temporary disruptions on recreational facilities. Descriptions of each BMP are provided in Chapter 2, *Project Description*.

BMP GEN-36: Public Outreach
BMP GEN-37: Implement Public Safety Measures

Conclusion

The Proposed Project would provide advanced public notification of closures and the placement of warning signs, barriers, and detours so that temporary access disruption or safety hazards along public trails or other recreational facilities caused by the proposed activities would be minimized. This impact would be less than significant and no mitigation would be required.

Mitigation Measures: No mitigation is required.

Impact REC–4: Permanent Use or Access Disruption of Recreational Facilities (Significance Criterion A; No Impact)

The Proposed Project could result in permanent impacts on recreational facilities if access or use of the facilities were permanently disrupted by proposed maintenance activities.

Sediment Removal

Sediment removal activities typically would last approximately 10 days but could last up to 8 weeks for larger sediment removal projects. Access to and use of recreational facilities would be disrupted during these maintenance activities. As previously described, once maintenance was completed, all affected paths, trails, and parking areas would be reopened for public use, and the sediment removal activities would not result in a permanent disruption of these facilities.

Other Maintenance Activities

As described above, other proposed maintenance activities (bank stabilization, vegetation management, minor maintenance, management of animal conflicts, canal maintenance) in any given location would be short-term in any given location, typically lasting no more than 10 days at a time. As described for sediment removal, access to and use of recreational facilities would be restored following the completion of maintenance activities and would not result in a permanent disruption.

Conclusion

Maintenance activities associated with the Proposed Project would not result in the permanent disruption of access to trails or any other recreation facilities, or in degradation of the recreational experience at these facilities. No impact would occur, and no mitigation would be required.

Mitigation Measures: No mitigation is required.

Chapter 3.12

TRAFFIC AND TRANSPORTATION

3.12 Traffic and Transportation

3.12.1 Introduction

This section describes the regulatory setting, environmental setting, and potential impacts of the Proposed Project related to traffic and transportation.

3.12.2 Regulatory Setting

Various levels of government or regulatory authority are responsible for some or all aspects of the planning, implementation, operations, and maintenance of transportation facilities and services in the Project Area. Several state, regional, and local agencies have jurisdiction over transportation planning in Santa Clara County.

Federal Plans, Policies, Regulations, and Laws

Federal Highways Administration

Federal statutes specify the procedures the U.S. Department of Transportation (DOT) must follow in setting policy regarding the placement of utility facilities within the rights-of-way of highways that receive federal assistance. These include expressways, most state highways, and certain local roads. The Federal Highway Administration (FHWA) regulations require each state to develop its own policy regarding the accommodation of utility facilities within the rights-of-way of such highways. Once FHWA has approved a state's policy, the state can approve any proposed utility installation without referral to FHWA, unless it does not conform to the policy.

Federal law does not directly control how states accommodate utilities within highway rights-of-way. However, in determining where a right-of-way on a federally aided highway should be used for accommodating a utility facility, the U.S. Secretary of Transportation must: (1) ascertain the effect accommodation of utilities will have on highway and traffic safety, because no such use may be authorized or permitted that would adversely affect safety; (2) evaluate the direct and indirect environmental and economic effects of any loss of productive agricultural land or any impairment of its productivity that would result from disapproving accommodation of the utility facility; and (3) consider the environmental and economic effects together with any interference with or impairment of the use of the highway that would result from accommodation of the utility facility (23 U.S. Code [USC] Section 109[1]). In addition, 23 USC Section 116 requires state highway agencies to ensure proper maintenance of highway facilities, which implies adequate control over non-highway facilities such as utility facilities. Furthermore, 23 USC Section 123 specifies when federal funds can be used to pay for the costs of relocating utility facilities in connection with highway construction projects.

The Hazardous Materials Act

The Hazardous Materials Act of 1974, directed by DOT, governs the transportation of hazardous materials. The main objective of this policy is to improve regulations and enforcement efforts that deal with the transportation of hazardous materials in commerce.

Title 49, Code of Federal Regulations

Title 49, Code of Federal Regulations (CFR), Sections 171-173 and 177 include general information, regulations, and definitions pertaining to the transportation of hazardous materials, the types of materials defined as hazardous, shipping requirements, marking of transportation vehicles, training requirements, and carriage by public highway. Title 49, CFR Sections 350-399 and Appendices A-G address safety issues for transport of goods, materials, and substances over public highways.

State Plans, Policies, Regulations, and Laws

California Department of Transportation

Caltrans has jurisdiction over state facilities including freeways and state highways. Caltrans also has jurisdiction over on- and off-ramp intersections at the interchanges between Caltrans facilities and local roadways. Improvements to freeways and state highways must meet Caltrans standards. Caltrans recommends a target level of service (LOS) at the threshold between LOS C and LOS D for their facilities. If the location under existing conditions operates worse than the appropriate target LOS, then the existing LOS should be maintained. LOS of intersections or roadway segments are not evaluated for this analysis.

Any encroachment within the right-of-way of a state highway or route is subject to Caltrans regulations, including issuance of an encroachment permit and the provisions of temporary traffic control systems. An encroachment, as defined in Section 660 of the Streets and Highways Coded, can be any tower, pole, pole line, pipe, pipe line, fence, billboard, stand, or building, or any structure or object of any kind or character that is within the right-of-way but not a part of the Caltrans facility. Authority for Caltrans to control encroachment within the state highway is contained in the Streets and Highways Code, starting with Section 660. Encroachment permits are intended to safeguard the affected jurisdictions' properties, either by providing preventive measures to be implemented during project construction or providing corrective measures if damage occurs. Traffic control systems can include traffic control warning signs, lights, and/or safety devices to ensure the safety of the traveling public.

See Section 3.1, *Aesthetics*, for further discussion of the Caltrans State Scenic Highway System.

California Vehicle Code

The California Vehicle Code (CVC) Section 353 defines hazardous materials. CVC Sections 31303-31309 include regulations for the transportation of hazardous materials, routes used, and any applicable restrictions. CVC Section 34500 et seq. regulates the safe operation of vehicles and includes those that are used for the transportation of hazardous materials. CVC Sections 2500-2505 authorize the issuances of licenses by the Commissioner of California Highway Patrol for the transportation of hazardous materials, including explosives. CVC Division 15, Size, Weight, and Load, Chapter 5, Article 6 contains transported load regulations. Approvals from Caltrans are required for transportation of oversized or excessive loads over state highways, including limitations based on axles and wheel base lengths. (Also see discussion Section 3.6, *Hazards and Hazardous Materials*.

California Streets and Highway Code

California Streets and Highway Code, Sections 117 and 660-672 and CVC 35780 et seq. require permits for the transportation of oversized loads on county roads.

Regional and Local Plans, Policies, Regulations, and Ordinances

Metropolitan Transportation Commission/Transportation 2035

The Metropolitan Transportation Commission (MTC) is the transportation planning, coordinating, and financing agency for the nine-county Bay Area. The current regional transportation plan, known as Transportation 2035, was adopted by MTC on April 22, 2009. Transportation 2035 specifies a detailed set of investments and strategies throughout the region from 2009 through 2035 to maintain, manage, and improve the surface transportation system.

Santa Clara Valley Transportation Authority/Congestion Management Program

The Santa Clara Valley Transportation Authority (VTA) serves three roles in the county: primary transit operator, Congestion Management Agency, and regional transportation planning agency. In its role as transit operator, the VTA is responsible for the development, operation, and maintenance of the bus and light rail system within the county. The VTA operates over 70 bus lines, three light rail lines (in addition to shuttle and paratransit service), and provides transit service to major regional destinations and transfer centers in adjoining counties.

VTA oversees the Congestion Management Program (CMP). State legislation requires that all urbanized counties in California prepare a CMP to obtain each county's share of gas tax revenues. The CMP legislation requires that each CMP contain five mandatory elements: 1) a system definition and traffic LOS standard element; 2) a transit service and standards element; 3) a trip reduction and transportation demand management element; 4) a land use impact analysis program element; and 5) a capital improvement element. The county's program includes the five mandated elements and three additional elements: a countywide transportation model and data base element; a bi-annual monitoring and conformance element; and a deficiency plan element. Preparation of a deficiency plan is required by cities

for CMP facilities that operate at unacceptable levels based on the CMP's standard. The purpose of a deficiency plan is to improve system-wide traffic flow and air quality. According to the VTA's Requirements for Deficiency Plans (1992), plans "allow local jurisdictions to adopt innovative and comprehensive transportation strategies for improving system-wide [operations] rather than adhering to strict traffic level of service standard that may contradict other community goals."

VTA requires that proposed development project impacts on the CMP system be addressed. The CMP system in San Jose includes the freeway and expressway systems, and a number of major regional roadways. For the purpose of this study, LOS on individual roadway segments is not evaluated. Instead, because this study is a program-level evaluation of proposed maintenance activities, vehicle miles traveled are estimated to evaluate the level of maintenance activity.

Santa Clara County Roads and Airports Department

Streets in unincorporated areas as well as all of the county expressways are managed under the auspices of the County Roads and Airports Department. Several larger, developed unincorporated areas exist near some of the work areas, including those in the Burbank area (east of the I-280/I-880-SR 17 interchange) and in the Cambrian area (between Jackson Drive and Leigh Avenue south of Camden Avenue). The County also is responsible for maintaining and operations of all of expressways and streets on its property.

Local Regulations/City Policies

Local municipalities in the county (Campbell, Cupertino, Gilroy, Los Altos, Los Altos Hills, Los Gatos, Milpitas, Monte Sereno, Morgan Hill, Mountain View, Palo Alto, San Jose, Santa Clara, Saratoga, and Sunnyvale) all have plans, policies, codes, ordinances, and/or guidelines (referred to hereafter as city policies) that regulate transportation activities within their jurisdictions. These city policies generally require LOS to remain at or above LOS C, D, or E, depending on the jurisdiction and the intersection (high volume versus low volume). Truck access is generally limited to truck routes that are defined by each jurisdiction. If a location is not along a truck route, municipalities encourage (for example) "trucks making local deliveries [to] proceed by the shortest route to the nearest truck route for travel." (City of Los Altos 2002) Stated another way, municipalities encourage trucks to stay "off local streets except for deliveries." (City of Santa Clara 2002) Local municipalities also have jurisdiction over all city/town streets and city-/town-operated traffic signals.

3.12.3 Environmental Setting

This section discusses the physical transportation system that provides access to SCVWD facilities.

Roadway Network

The county's transportation network is comprised of freeways, expressways, arterial roadways, collector roadways, and local streets. Freeways are designed for low accessibility (limited connections to other facilities provided by grade-separate interchanges) and high mobility (throughput of traffic movement). Conversely, local streets are designed for high

accessibility (access to adjacent properties) and low mobility. Other roadways fall in between these two roadway types. The county's main vehicular roadway types are described next.

Freeways

U.S. 101 is a north-south freeway in the county. The freeway includes four mixed-flow lanes per direction, including high occupancy vehicles (HOV) lanes during peak periods. HOV lanes, also known as diamond or carpool lanes, restrict use to vehicles with two or more persons (carpools, vanpools, and buses) or motorcycles during the peak morning (5:00 a.m. to 9:00 a.m.) and evening (3:00 p.m. to 7:00 p.m.) commute periods. Northbound U.S. 101 is generally the peak morning commute direction, and southbound U.S. 101 is the peak evening commute direction. U.S. 101 extends through the county, from south of Gilroy to north of Palo Alto via downtown San Jose and Mountain View.

I-280 is a north-south freeway extending from the U.S. 101 interchange in San Jose north to San Francisco. East of the U.S. 101 interchange, I-280 is designated as I-680. The freeway includes four to five mixed-flow lanes per direction, including HOV lanes north of the I-280/I-880/SR 17 interchange. The peak commute directions on I-280 are northbound in the morning and southbound in the evening. I-280 extends through the county, between approximately Alpine Road in Palo Alto and U.S. 101 in San Jose via Cupertino.

I-680 is a north-south freeway extending from the I-280/I-680/U.S. 101 interchange in San Jose north to Solano County. Within the county, the freeway includes four mixed-flow lanes per direction. Peak commute directions on I-680 are southbound in the morning and northbound in the evening. From the north, I-680 enters the county at the northern Milpitas city limit.

I-880 is a north-south freeway extending from San Jose at the I-280/I-880/SR 17 interchange to Oakland. This facility includes three to four mixed-flow lanes per direction. Northbound I-880 is the peak commute direction in the morning, and southbound I-880 is the peak commute direction in the evening. I-880 enters the county from the north at the northern Milpitas city limit.

SR 17 is a north-south freeway extending from San Jose at the I-280/I-880/SR 17 interchange to Santa Cruz. The facility includes two to three mixed-flow lanes per direction. Northbound is the peak direction in the morning, and southbound is the peak direction in the evening. SR 17 exits the county at Skyline Boulevard in the Santa Cruz Mountains south of Los Gatos.

SR 85 is a north-south freeway extending through the county from the SR 85/U.S. 101 interchange in Mountain View to the SR 85/U.S. 101 interchange in south San Jose via Los Gatos and Saratoga. This facility includes three to four mixed-flow lanes per direction, including HOV lanes during peak periods. Northbound SR 85 is the commute direction in the morning, and southbound SR 85 is the commute direction in the evening. The freeway is located entirely within the county.

SR 87 is a north-south freeway extending from the SR 85/SR 87 interchange in south San Jose to the U.S. 101/SR 87 interchange north of downtown San Jose. This facility includes three mixed-flow lanes per direction, including HOV lanes during peak periods. Northbound SR 87 is the commute direction in the morning, and southbound SR 87 is the commute direction in the evening. SR 87 is located entirely within San Jose.

SR 237 is an east-west freeway extending between Mountain View and Milpitas. This freeway includes three mixed-flow lanes per direction, including HOV lanes during peak periods. Traffic is evenly split between the eastbound and westbound commute directions during both the morning and evening commute times. The freeway is located entirely within the county.

Conventional State Highways

This type of roadway facility is operated and maintained by Caltrans. SR 9 (Saratoga-Los Gatos Road/Big Basin Way/Congress Springs Road), SR 82 (Monterey Road/The Alameda/ El Camino Real), SR 130 (Alum Rock Avenue/Mt. Hamilton Road), SR 152 (Pacheco Pass Road/1st Street/Leavesley Road/Hecker Pass Highway), SR 25 (Hollister Road), and SR 237 (Calaveras Boulevard) east of I-880 are the designated state highways in the county. In general, state highways have a primary function of traffic movement. However, some locations have a reduced emphasis on vehicle mobility, such as The Alameda, because its characteristics include numerous access points and fronting uses for the neighborhood business district.

Expressways

Expressways are facilities designed primarily for traffic movement, and they provide limited access to abutting properties. These facilities generally include median areas dividing traffic directions, some intersecting streets allowing only right-turn access, some grade-separated interchanges, and some signalized intersections allowing full access. Expressways are maintained and operated by the County Roads and Airports Department. The Department controls access to and operation of traffic signals on each of these facilities. The expressways located in the county include: Almaden Expressway, Capitol Expressway, Central Expressway, Foothill Expressway, Lawrence Expressway, Montague Expressway, Oregon Expressway, San Tomas Expressway, and Southwest Expressway.

Arterial Roadways

Arterial roadways are facilities that accommodate major movements of traffic not served by freeways, expressways, or state highways. They are designed mainly for the movement of through traffic and the provision of access to abutting properties is a secondary function. Although abutting properties have access to the facilities, parking and loading may be restricted or prohibited to improve the capacity for moving traffic. The number of lanes on this type of facility depends on its function, its location, and the volume of traffic it is expected to handle; however, arterials generally are planned to have four or more travel lanes. Selected arterial roadways in the county include, but are not limited to: Blossom Hill Road, De Anza Boulevard, Mathilda Avenue, Middlefield Road, San Antonio Road, Santa Teresa Boulevard, and Stevens Creek Boulevard.

Collector Roadways

Collector roadways are facilities that serve internal traffic movements within a specific area or neighborhood and provide connections to the arterial street system. Collectors typically do not serve through trips but provide access to abutting properties and connections to local streets. Traffic control devices may be installed to protect or facilitate traffic on a collector street. Some examples of collectors in the county include: Foxworthy Avenue, Llagas Road, Miramonte Avenue, Monroe Street, Pierce Road, Ruby Avenue, and Stelling Road.

Local Streets

Local streets are facilities having the primary function of providing access to immediately adjacent properties. The majority of streets in the county are local streets that provide access to residential and commercial properties.

Public Transit

Existing public transit service within the county is provided by VTA and consists of bus, light rail transit, and paratransit service. Commuter rail service is provided by Caltrain, the Altamont Commuter Express, and the Capitol Corridor. These services are described in Table 3.12-1.

Table 3.12-1. Transit Service within Santa Clara County

Provider (Operator)	Service	Rail Stop Examples	Extent of Service	Frequency
Santa Clara Valley Transportation Authority (VTA)	Local, limited-stop, express, and rapid bus; Light rail transit	Santa Teresa, Alum Rock, Winchester, Convention Center, Mountain View	Santa Clara County	Varies for bus service; Light rail headways range from 15 to 45 minutes
OUTREACH	Paratransit	Not available	Not available	Not available
Caltrain (Peninsula Joint Powers Board)	Commuter Rail	Sunnyvale, San Jose Diridon, Tamien, Gilroy	San Francisco to San Jose, select trains to Gilroy	Weekday headways 30 to 60 minutes; Weekend headways 60 minutes
Altamont Commuter Express (San Joaquin Regional Rail Commission)	Commuter Rail	Great America, San Jose Diridon	Stockton to San Jose	Four eastbound and four westbound trains, 60 minute headways, commute periods only
Capitol Corridor (Capitol Corridor Joint Powers Authority)	Commuter Rail	Great America, San Jose Diridon	Auburn to San Jose	Seven southbound and seven northbound trains

Sources: VTA 2010, Outreach 2010, Caltrain 2010, ACE 2010, Capitol Corridor 2010

Pedestrian Circulation

Pedestrian facilities improve safety for pedestrians and also can encourage the use of alternative modes of transportation. These facilities include sidewalks, paths, pedestrian bridges, crosswalks, and pedestrian signals with crosswalks at signalized intersections to accommodate pedestrian circulation. In California, it is legal for pedestrians to cross any street, except at unmarked locations between immediately adjacent signalized crossings or where crossing is expressly prohibited. Marked crossings reinforce the location and legitimacy of a crossing. The county's pedestrian network consists of sidewalks, multi-use paths/trails, and both grade-separated and at-grade crossings. The county has many areas that are especially conducive to walking for recreation and transportation, particularly in downtown areas and along off-street paths.

Bicycle Circulation

The typical California standards for bikeways, described in Chapter 1000, "Bikeway Planning and Design" in the Caltrans *Highway Design Manual* (2006), include three distinct types of bikeway facilities:

Bike paths (Class I) are paved pathways separated from roadways that are designated for the exclusive use of bicycles, pedestrians, and other non-motorized means of transport. In general, bike paths serve corridors that are not served by streets and highways or where sufficient right-of-way exists to allow such facilities to be constructed away from the influence of parallel streets and numerous vehicle conflicts. Examples include the Coyote Creek Trail, Los Gatos Creek Trail, San Tomas Aquino Creek Trail, and the Stevens Creek Trail, all of which have asphalt or concrete surfaces.

Bike lanes (Class II) are lanes for bicyclists adjacent to the outer vehicle travel lanes. These lanes have special lane markings, pavement legends, and signage. Bike lanes are usually constructed to better accommodate bicyclists through corridors where insufficient room exists for safe bicycling on existing streets. Example bike lanes include those on Campbell Avenue, Curtner Avenue, De Anza Boulevard, Dunne Avenue, Fremont Avenue, Los Gatos Boulevard, Milpitas Boulevard, Reed Avenue, Saratoga Avenue, Page Mill Road, and Santa Teresa Boulevard.

Bike routes (Class III) in general are located on low traffic volume streets that provide alternate routes for recreational users, and in some cases, for commuter and school-age cyclists. These facilities are signed for bike use but have no separated bike right-of-way or lane striping. Bike routes serve either to provide continuity to other bicycle facilities or designate preferred routes through high-demand corridors. Examples include bike routes on Benton Street, Covington Road, Mary Avenue, and Meridian Avenue. Some routes, such as San Fernando Street between SR 87 and San Jose Diridon Station (where additional width for bike lanes was not available), feature "sharrow" symbols, installed on the pavement to designate the appropriate travel path for cyclists and increase driver awareness of bicycles. Other routes, such as Bryant Street in Palo Alto, are designated as "Bicycle Boulevards" that employ traffic calming measures to encourage bicycle use of the street but discourage automobile through trips.

Existing Daily Vehicle Trips Generated and Miles Traveled

The following discussion presents estimates regarding the existing SMP. The amount of vehicle trips generated and vehicle miles traveled (VMT) can be obtained through historical maintenance activity records and estimates of average trip lengths, or through the use of a validated travel demand model that estimates vehicle demand. The former was used for this analysis.

Traffic Estimates

The estimate for maintenance vehicle trips that would be generated by the existing SMP activities were developed using SCVWD data, including estimated annual gross sediment removal totals, defined dry season maintenance window, typical off-haul truck capacity, and typical loading rates and procedures.

The multi-step process for estimating the Proposed Project maintenance trips is described below and included the following steps:

- Processed historical data
- Made assumptions to supplement historical data
- Estimated average daily trips generated
- Estimated annual trips generated

Trips would be made by four types of vehicles: light duty vehicles, medium duty vehicles, heavy duty vehicles, and other large trucks. For the purposes of this analysis, light duty vehicles include vehicle types such as minivans and sedans. Medium duty vehicles include vehicles such as Ford F-150s and Rangers. Heavy duty vehicles include vehicles such as Ford F-350s, F-450s, crane trucks, water trucks, cargo vans, and Bobtail dump trucks. Other large trucks include vehicle types such as large 10-cy sediment removal dump trucks, 20-cy vegetation removal compactors, and other large semi-trucks that are used to haul equipment or similar amounts of materials. A full list of vehicles included in each vehicle type is provided in Table K8 of Appendix K in this document.

1) Process Historical Data

The SCVWD's historical data included the number and hours that light, medium, and heavy duty vehicles have been used for each stream maintenance activity (e.g., sediment removal, vegetation removal, animal conflicts management, minor maintenance, and bank stabilization) (Williams and Smith, pers. comm., 2010). Historical data for contract vehicles was not available because such vehicles are not owned by SCVWD (Williams and Smith, pers. comm., 2010). The historical data is shown in Tables K11 through K15 of Appendix K in this document. The historical number and hours that SCVWD vehicles used for each stream maintenance activity was processed, and the average number of trips per day was determined, based on this data.

2) Assumptions to Supplement Historical Data

Assumptions were made to estimate the remaining vehicle trips because not all vehicle types were included in the historical data provided by SCVWD. This analysis includes the following assumptions to estimate existing SMP vehicle trip generation:

- Sediment removal dump trucks have an 8-cy capacity.
- The dry season work period is 85 work days, although some activities such as minor maintenance and vegetation removal occur year-round (see Chapter 2, *Project Description*, pages 2-35 through 2-40). (The calculation for dry season work days is shown in Table K18 of Appendix K in this document.)
- Seasonal trips are calculated by multiplying the average daily trips by the number of work days in the season.
- A daily work period is 8 work hours.
- Two trucks are used to deliver materials or equipment to each job site.
- Eight deliveries of materials are made from quarries to SCVWD headquarters per year.
- One delivery of materials is made from SCVWD headquarters to each work site.
- Each light, medium, and heavy duty vehicle makes more than two trips per day. Some trips may be from one work site to another and other trips may be made to pick up supplies from either the corporate yard or from a local hardware store. Therefore, these vehicles do not necessarily make one trip to the work site and one return trip.
- Activities are performed at 8–28 work sites per day.
- The number of bank stabilization work sites, sediment removal volumes, deliveries per basin or subbasin, and some light duty vehicle usage are based on percentages of waterbody miles in each basin or subbasin.
- The number of trips generated by other large trucks for sediment removal activities was calculated by dividing the average historic sediment removal amounts (see Chapter 2, *Project Description*, page 2-5) by the truck hauling capacity of 8-cy.
- Two truck trips are generated for each bank stabilization work site and the number of work sites was provided by SCVWD.

3) Estimated Average Daily Trips Generated

The average daily vehicle trips of light, medium, and heavy duty vehicles were added to average daily other large truck trips to calculate the average number of trips per day that is estimated to occur under the SMP.

4) Estimated Average Annual Trips Generated

Seasonal trips during the dry season were calculated by multiplying the average daily dry season trips by the number of work days in the dry season. Similarly, the trips during the remainder of the year were calculated by multiplying the average daily remainder of the year trips by the number of work days in the remainder of the year. The annual trips generated were calculated by adding the dry season trips to the trips generated during the remainder of the year.

The existing SMP generates 1,114 daily one-way maintenance trips during the dry season and 544 one-way daily maintenance trips during the remainder of the year (all references to trips in the remainder of this section refer to one-way trips). This is equivalent to 94,690 dry season maintenance trips and 92,480 maintenance trips during the remainder of the year, resulting in 187,170 annual maintenance trips. Table 3.12-2 shows the trip generation estimates for each SCVWD basin per day; Table 3.12-3 shows the trip generation estimates per year.

Table 3.12-2. Existing SMP Trip Generation Estimates per day

Basin	Sub-Basin	Average Vehicle Trips per Day	
		Dry Season[1]	Remainder of Year
Santa Clara Valley	Lower Peninsula	188	122
	West Valley	254	160
	Guadalupe	202	70
	Coyote	327	142
	Subtotal (A)	***971***	***494***
Pajaro River (B)	-	143	50
Total (A+B)		**1,114**	**544**

Notes:
[1] The dry season generally is from June 15 through October 15.
Source: Fehr & Peers 2011

Table 3.12-3. Existing SMP Trip Generation Estimates per year

Basin	Sub-Basin	Average Vehicle Trips per Year		
		Dry Season[1]	Remainder of Year	Total
Santa Clara Valley	Lower Peninsula	18,577	18,143	**36,720**
	West Valley	24,683	24,107	**48,790**
	Guadalupe	14,707	14,363	**29,070**
	Coyote	26,274	25,661	**51,935**
	Subtotal (A)	***84,241***	***82,274***	***166,515***
Pajaro River (B)	-	10,449	10,206	20,655
Total (A+B)		**94,690**	**92,480**	**187,170**

Notes:
[1] The dry season generally is from June 15 through October 15.
Source: Fehr & Peers 2011

Vehicle Miles Traveled Estimates

Transportation is a major contributor to greenhouse gas emissions. According to the U.S. Environmental Protection Agency, the transportation sector was responsible for nearly 28 percent of all greenhouse gas (GHG) emissions in the United States in 2006 (USEPA 2008), and transportation in California was responsible for about 38 percent of GHG emissions in 2004 (CARB 2008). Transportation is the direct result of population and employment growth, which generates vehicle trips to move goods, provide public services, and connect people with work, school, shopping, and other activities such as construction (see Section 3.5, Global Climate change).

A performance measure used to quantify the amount of travel is VMT. VMT is a useful performance measure because the amount of travel and conditions under which the travel occurs directly relate to how much fuel vehicles burn. As a result, increases in VMT directly cause increases in greenhouse gas emissions and air pollution (see also Section 3.5, *Global Climate Change*).

The multi-step process for estimating the SMP VMT is described below and included the following steps.

- Processed historical VMT data
- Estimated average trip length
- Estimated trip distribution
- Estimated average daily VMT
- Estimated annual VMT

1) Historical VMT Data Review

As mentioned previously, the historical number of miles for some district vehicles was provided by SCVWD (Williams and Smith, pers. comm., 2010), and this data was used to determine average miles traveled per year. The historical data provided by SCVWD is included in Table K9 of Appendix K in this document.

2) Estimate Average Trip Length

Average trip lengths were determined by calculating the length between each basin/subbasin and disposal locations, SCVWD headquarters, and the animal control offices, and the length between SCVWD headquarters and the quarries. Because basins/subbasins do not have an address per se but cover a wide area of land, for the purposes of this VMT analysis, the following assumptions were made:

- Each basin/subbasin was generalized to a point location near the center of the basin/subbasin to more easily calculate trip length distances (Williams and Smith, pers. comm., 2010). (The list of point locations are shown in Table K14 of Appendix K and the trip distances are shown in Table K19 of Appendix K in this document.)

- Only the areas below 1,000 feet in elevation were used to determine the centers of each basin/subbasin (see Chapter 2, *Project Description*, page 2-6).

3) Estimate Trip Distribution

Trips are made to and from multiple sites: multiple project sites in each basin/subbasin, disposal locations, SCVWD headquarters, quarries, and the animal control offices. Therefore, the following assumptions were made to determine what percentage of traffic went to and from each site:

- The directions of approach and departure for work activity-related traffic were estimated based on historical data of work sites provided by SCVWD (Williams and Smith, pers. comm., 2010), possible work site locations, the sediment disposal/reuse locations, SCVWD headquarters, and other locations including, but not limited to, rock quarries and the animal control offices.

- The distribution of trips from each basin/subbasin to each disposal/reuse site was based on the percentage of the basin/subbasin nearest to each disposal/reuse site (Williams and Smith, pers. comm., 2010).

These assumptions also are included in Tables K16 and K17 of Appendix K in this document.

4) Estimate Average Daily VMT

The VMT for the SMP was estimated as the trips generated resulting from the SMP (presented in Tables 3.12-4 and 3.12-5) multiplied by the estimated distance those trips would travel. Also, the VMT estimated in this step was compared to the historical VMT, calculated in the first step.

5) Estimate Annual VMT

Seasonal VMT during the dry season was calculated by multiplying the average daily dry season VMT by the number of work days in the dry season. Similarly, the VMT during the remainder of the year was calculated by multiplying the average daily remainder of the year VMT by the number of work days in the remainder of the year. The annual VMT was calculated by adding the dry season VMT to the VMT generated during the remainder of the year.

The SMP generates 13,273 daily VMT during the dry season and 7,192 daily VMT during the remainder of the year. This is equivalent to 1,128,205 dry season VMT and 1,222,641 VMT during the remainder of the year, resulting in 2,350,846 annual VMT.

Table 3.12-4. Existing SMP Vehicle Miles Traveled Estimates per day

Basin	Sub-Basin	Average Vehicle Miles Traveled per Day	
		Dry Season[1]	Remainder of Year
Santa Clara Valley	Lower Peninsula	2,643	2,023
	West Valley	2,880	2,029
	Guadalupe	1,894	635
	Coyote	3,965	1,686
	Subtotal (A)	***11,382***	***6,373***
Pajaro River (B)	-	1,892	819
Total (A+B)		**13,273**	**7,192**

Notes:
[1] The dry season generally is from June 15 through October 15.
Source: Fehr & Peers 2011

Table 3.12-5. Existing SMP Vehicle Miles Traveled Estimates per year

Basin	Sub-Basin	Average Vehicle Miles Traveled per Year		
		Dry Season[1]	Remainder of Year	Total
Santa Clara Valley	Lower Peninsula	272,846	295,684	568,530
	West Valley	282,988	306,676	589,664
	Guadalupe	129,067	139,871	268,938
	Coyote	299,277	324,327	623,604
	Subtotal (A)	***984,178***	***1,066,558***	***2,050,736***
Pajaro River (B)	-	144,027	156,083	300,110
Total (A+B)		**1,128,205**	**1,222,641**	**2,350,846**

Notes:
[1] The dry season generally is from June 15 through October 15.
Source: Fehr & Peers 2011

3.12.4 Impact Analysis

Methodology

Proposed Daily Vehicle Trips Generated and Miles Traveled

The methods and process used to estimate existing SMP maintenance vehicle trips generated and VMT also were used to estimate the trips and VMT that would be generated by the Proposed Project.

The Proposed Project generally would extend the dry season work period from October 15 to the first rainfall or December 31, whichever was earlier. Adjusting for rain variation and work activity needs, it is estimated that approximately 25 percent more dry season maintenance activities could be completed in this time period (Williams and Smith, pers. comm., 2010). Therefore, the current work window of 85 days would be extended so that the proposed dry season work window would be 106 days (85 days times 1.25). Some current maintenance activities that occur outside of the typical dry season would shift into the dry season work window. Therefore, some of the trips and VMT generated in the dry season of the Proposed Project would be trips and VMT formerly generated outside of the typical dry season, under the existing SMP.

Traffic Estimates

As mentioned previously, the process used to estimate the maintenance vehicle trips that are generated by the existing SMP activities also was used to estimate trips to be generated by the Proposed Project. The results of these trip estimates are described next.

The Proposed Project is estimated to generate 1,114 daily maintenance trips during the dry season and 544 daily maintenance trips during the remainder of the year, which are the same as under the existing SMP. Unlike the existing SMP and because the dry season work window would be extended under the Proposed Project, this would be equivalent to 118,084 dry season maintenance trips and 81,056 maintenance trips during the remainder of the year, resulting in 199,140 annual maintenance trips, an increase of 11,960 annual trips (which would be the same as an increase of approximately 70 trips per hour or between two and ten trips per hour per work site). Table 3.12-6 shows the annual Proposed Project trip generation estimates for each SCVWD basin. Proposed Project maintenance activity would occur year-round, truck traffic would be spread out over the day, the individual activities would be temporary in nature, the individual activities would vary in location, and the amount of peak-hour trips generated by the Proposed Project would be an average of approximately 140 hourly trips. Furthermore, at each work site, the level of peak-hour trips generated by the Proposed Project generally would be low (e.g., an average of approximately 20 hourly trips). Therefore, an intersection and roadway LOS analysis was not conducted.

Table 3.12-6. Proposed Project Trip Generation Estimates per year

Basin	Sub-Basin	Average Vehicle Trips Per Year		
		Dry Season[1]	Remainder of Year	Total
Santa Clara Valley	Lower Peninsula	19,928	18,178	38,106
	West Valley	26,924	23,840	50,764
	Guadalupe	21,412	10,430	31,842
	Coyote	34,662	21,158	55,820
	Subtotal (A)	***102,926***	***73,606***	***176,532***
Pajaro River (B)	-	15,158	7,450	22,608
Total (A+B)		**118,084**	**81,056**	**199,140**

Notes:

[1] The dry season generally would be from June 15 through the first significant rainfall after October 15 or December 31, whichever was earlier. The dry season would be extended by 21 days to 106 days under the Proposed Project.

Source: Fehr & Peers 2011

Vehicle Miles Traveled Estimates

As mentioned previously, the method used to estimate the VMT that would be generated by the existing SMP activities also was used to estimate the VMT that would be generated by the Proposed Project. The results of the VMT estimates are described next.

The Proposed Project would generate 13,273 daily VMT during the dry season and 7,192 daily VMT during the remainder of the year, which would be the same as the existing SMP. Unlike the existing SMP and because the dry season work window would be extended under the Proposed Project, this would be equivalent to 1,406,938 dry season VMT and 1,071,609 VMT during the remainder of the year, resulting in 2,478,547, an increase of 127,701 annual VMT. Table 3.12-7 shows the annual VMT estimates for each SCVWD basin under the Proposed Project.

Table 3.12-7. Proposed Project Vehicle Miles Traveled Estimates per year

Basin	Sub-Basin	Average Vehicle Miles Traveled Per Year		
		Dry Season[1]	Remainder of Year	Total
Santa Clara Valley	Lower Peninsula	329,806	251,200	581,006
	West Valley	345,208	262,931	608,139
	Guadalupe	167,660	127,700	295,360
	Coyote	381,132	290,293	671,425
	Subtotal (A)	***1,223,806***	***932,124***	***2,155,930***
Pajaro River (B)	-	183,132	139,485	322,617
Total (A+B)		**1,406,938**	**1,071,609**	**2,478,547**

Notes:

[1] The dry season generally would be from June 15 through the first significant rainfall after October 15 or December 31, whichever was earlier. The dry season would be extended by 21 days to 106 days under the Proposed Project.

Source: Fehr & Peers 2011

Criteria for Determining Significance

For the purposes of this analysis, the Proposed Project would result in a significant impact on traffic and transportation if it would:

A. exceed, either individually or cumulatively, level of service standards established by local or regional agencies for designated roads or highways, or otherwise cause a substantial increase in traffic in relation to the planned or designated traffic load and capacity of the circulation system;

B. substantially increase hazards or result in substantial safety risks due to a design feature (e.g., sharp curves, inadequate emergency service access, or dangerous intersections) or incompatible uses (e.g., haul routes through residential neighborhoods or by schools);

C. result in inadequate emergency access or interfere with adopted emergency evacuation plan;

D. result in incompatible land uses through inadequate parking capacity or parking/staging activities on residential streets; or

E. conflict with adopted policies, plans or programs supporting alternative transportation (e.g. bus turnouts, bicycle lanes, bicycle racks).

To evaluate the Proposed Project, these guidelines are interpreted as follows in the sections below.

Design Review Considerations Criteria

A design impact from a transportation improvement would be considered significant if the Proposed Project would introduce a design feature from a transportation improvement or incompatible use that substantially increased safety hazards.

Emergency Response Time Impact Criteria

An emergency response time impact would be considered significant if implementation of the Proposed Project would provide inadequate access to accommodate emergency vehicles.

Alternative Transportation Impact Criteria

An alternative transportation impact would be considered significant if implementation of the Proposed Project would:

- Disrupt ongoing, or interfere with planned transit services or facilities;
- Disrupt existing bicycle facilities; interfere with planned bicycle facilities; conflict or create inconsistencies with adopted bicycle system plans, guidelines, policies or standards; or not provide secure and safe bicycle parking in adequate proportion to anticipated demand; or

- Disrupt existing pedestrian facilities; interfere with planned pedestrian facilities; not provide accessible pedestrian facilities that meet current Americans with Disabilities Act (ADA) best practices; or would create inconsistencies with adopted pedestrian system plans, guidelines, policies or standards.

Structure of Impact Discussion

Because traffic and transportation impacts would be the result of maintenance activities as a whole, specific discussions by work activity are not included in the impact analysis below.

Environmental Impacts

Impact TR-1: Increase in Vehicle Miles Traveled (Significance Criterion A; Less than Significant)

The current SMP results in 13,273 daily maintenance VMT during the dry season and 2,350,846 annual VMT. Due to the extension in the number of days of operation, the Proposed Project would continue to produce 13,273 daily maintenance VMT during the dry season, but would result in 2,478,547 annual VMT, an increase of 127,701 annual VMT. This could result in a substantial increase in traffic in relation to the planned or designated traffic load and capacity of the circulation system.

Applicable Best Management Practices

The following BMPs would be implemented as part of the SMP Update to reduce impacts on emergency access. Descriptions of each BMP are provided in Chapter 2, *Project Description*.

BMP GEN-36: Public Outreach
BMP GEN-39: Planning for Pedestrians, Traffic Flow, and Safety Measures

Conclusion

Because of the temporary nature of proposed maintenance activities at any given location, the fact that Proposed Project-generated traffic would be distributed across the county, and with implementation of these BMPs, the increases in traffic are not anticipated to be substantial. For these reasons, impacts would be less than significant and no mitigation would be required.

Mitigation Measures: No mitigation is required.

Impact TR-2: Substantial Increase in Safety Hazards (Significance Criteria B, C; Less than Significant)

The Proposed Project's maintenance activities may require temporary lane closures, and these closures may increase safety risks by forcing lane changes that would not be made otherwise.

Applicable Best Management Practices

The following BMPs would be implemented as part of the SMP Update to reduce impacts on emergency access. Descriptions of each BMP are provided in Chapter 2, *Project Description*.

BMP GEN-36: Public Outreach
BMP GEN-37: Implement Public Safety Measures
BMP GEN-39: Planning for Pedestrians, Traffic Flow, and Safety Measures

Conclusion

Because of the temporary nature of proposed maintenance activities, and with implementation of these BMPs, impacts would be less than significant and no mitigation would be required.

Mitigation Measures: No mitigation is required.

Impact TR-3: Inadequate Emergency Access (Significance Criteria A, B, C; Less than Significant)

The Proposed Project may require temporary lane closures which could hinder emergency response times.

Applicable Best Management Practices

The following BMPs would be implemented as part of the SMP Update to reduce impacts on emergency access. Descriptions of each BMP are provided in Chapter 2, *Project Description*.

BMP GEN-36: Public Outreach
BMP GEN-37: Implement Public Safety Measures
BMP GEN-39: Planning for Pedestrians, Traffic Flow, and Safety Measures

Conclusion

Because of the temporary nature of proposed maintenance activities, and with implementation of these BMPs, impacts would be less than significant and no mitigation would be required.

Mitigation Measures: No mitigation is required.

Impact TR-4: Disruption of Alternative Transportation Facilities or Services (Significance Criteria A, D, E; Less than Significant)

The Proposed Project could interfere with level of service standards established by local or regional agencies for designated roads or highways, or with planned transit services or facilities. Proposed maintenance activities could require temporary road or lane closures.

The Proposed Project could interfere with planned bicycle facilities or conflict with/create inconsistencies with adopted bicycle system plans, guidelines, policies, or standards. Furthermore, secure and safe bicycle parking could become temporarily unavailable at

specific work sites. In addition, work activities may affect bicycle facilities and require temporary lane closures.

Temporary sidewalk closures related to proposed maintenance work activities could cause short-term interference with planned pedestrian facilities, change accessible pedestrian facilities that meet current ADA best practices, or create inconsistencies with adopted pedestrian system plans, guidelines, policies, and standards.

Applicable Best Management Practices

The following BMPs would be implemented as part of the SMP Update to reduce impacts on level of service standards, transit services and facilities, bicycle facilities, and pedestrian facilities. Descriptions of each BMP are provided in Chapter 2, *Project Description.*

BMP GEN-36: Public Outreach
BMP GEN-37: Implement Public Safety Measures
BMP GEN-39: Planning for Pedestrians, Traffic Flow, and Safety Measures

Conclusion

Because of the temporary nature of proposed maintenance activities, and with implementation of these BMPs, impacts would be less than significant and no mitigation would be required.

Mitigation Measures: No mitigation is required.

Impact TR-5: Insufficient Parking Capacity (Significance Criterion D; Less than Significant)

In general, Proposed Program-related parking would occur within SCVWD rights-of-way. For parking which is not able to be kept within these locations, it is generally anticipated that parking space in the Project Area would be sufficient to accommodate work staging and worker vehicle parking. Consequently, impacts related to parking would be less than significant.

Occasionally, maintenance work activities may occur within areas that contain limited parking spaces for worker vehicles. In this case, workers may need to park outside the immediate area affected. Although the increased walking distance from a parking space to the work site would be an inconvenience, this would be a temporary and less-than-significant impact.

Consequently, maintenance activity impacts related to parking would be less than significant.

Mitigation Measures: No mitigation is required.

Chapter 3.13

WATER QUALITY

3.13 Water Quality

3.13.1 Introduction

This section describes the regulatory setting, environmental setting, and potential impacts of the Proposed Project as related to water quality.

Data sources used to prepare this section include sediment and water quality monitoring reports by SCVWD (2008, 2009, 2010); the basin plans of the San Francisco Bay Regional Water Quality Control Board (San Francisco Bay RWQCB 2007) and the Central Coast RWQCB (2006b); the Santa Clara Basin Watershed Management Initiative's watershed management plan (2000); and the California Department of Water Resources' (DWR) Bulletin 118, California's Groundwater Bulletin (2003). Other applicable regulations and background documents also were reviewed.

The Proposed Project activities focus on managing streams, flood protection channels, and other flood management-related facilities. Several Proposed Project activities are directly related to and influenced by hydrologic and water quality processes. The following define the key hydrologic and water quality concepts and terminology used in this section.

Dissolved Oxygen

Dissolved oxygen (DO) is a measure of the amount of oxygen dissolved in water. DO is an important water quality parameter for aquatic invertebrates and fish, which depend on such oxygen to survive. DO levels depend on various factors, such as temperature, aeration factors (i.e., inflow, wind, waves), salinity, and the relative amount of oxygen generation (caused by photosynthesis by plants) and oxygen use (caused by respiration by animals and biodegradation of organic matter) that takes place in the water. Low DO levels also can occur during low flow conditions because water temperatures are higher and because of the absence of aeration caused by mixing during higher flows. Hypersaturated conditions (DO that is well above 100 percent saturation) can be indicative of excessive plant growth and eutrophic conditions. Large daily fluctuations in DO also can be an indicator of eutrophication because DO levels can drop to toxic levels at night as aquatic plants respire.

Mercury

Mercury (Hg) is a toxic constituent that bioaccumulates in the food chain of aquatic organisms and terrestrial wildlife, and is ultimately a human health concern primarily through the consumption of Hg-contaminated fish. Methylmercury (MeHg) is a more bioavailable form of Hg that is produced from inorganic Hg by specific types of bacteria in the sediments of rivers and reservoirs. The major pathway for human exposure to methylmercury (MeHg) is consumption of Hg-contaminated fish. Dietary MeHg is almost completely absorbed into the blood and is distributed to all tissues including the brain. In pregnant women, it also readily passes through the placenta to the fetus and fetal brain. MeHg is a highly toxic substance with a number of adverse health effects associated with its exposure in humans and animals. High-dose human exposure results in mental retardation,

cerebral palsy, deafness, blindness, dysarthria (a motor speech disorder) in utero, and in sensory and motor impairment in adults.

Nutrients

Nutrients, specifically nitrogen and phosphorus, are essential for life and play, having a primary role in ecosystem functions. Nitrogen and phosphorus are naturally occurring inorganic ions present within the atmosphere and in fixed forms within organic matter, such as plants and soils. In addition to naturally present concentrations, nutrients are introduced to water bodies through human or animal waste disposal or agricultural application of fertilizers.

Nutrients are commonly the limiting factor for growth in aquatic systems. Nutrient concentrations change seasonally, as aquatic plants respond to changes in the amount and duration of sunlight and either sequester or release nutrients as they grow or decompose. Agricultural fertilizers, domestic and native animal waste (e.g., manure), and human waste (e.g., leaky septic systems) can lead to elevated nutrients above background levels and stimulate plant growth. Rainfall, stream flow, and air and water temperature all influence nutrient concentrations in the watershed.

Pathogens

Pathogens are microorganisms that cause diseases in other organisms. Bacteria are the primary indicator organisms of pathogens, particularly for the detection of waterborne diseases. Waterborne diseases threaten the health of recreational users of waters and wildlife. Pathogenic bacteria contained within fecal waste are the most common source of waterborne diseases. Fecal contamination can be detected by bacterial indicators, such as total coliforms, fecal coliforms, *Escherichia coli* (*E. coli*), and fecal *enterococci*. High concentrations of these indicator bacteria—resulting from poor waste management and disposal, agricultural activities (i.e., grazing), and sometimes from homeless encampments along the creek banks—can degrade water quality for human consumption, recreation, and wildlife use.

Pesticides

Pesticides are chemicals designed to control, destroy, repel, or attract a target pest and are purposely introduced into the environment to manage insects, bacteria, weeds, rodents, or other pests. Pesticides may enter surface waters through direct application (i.e., aquatic pesticides) or through surface runoff. Farmers use pesticides to control the pests that can destroy or damage food and other crops. Aquatic pesticides typically are used to combat insects and other organisms known to carry disease (like West Nile virus) or for aquatic vegetation management. (CDPR 2010)

Salinity

Salinity typically is measured by the concentration of anions (salts) dissolved in water. This is determined by measuring total dissolved solids in water and the electrical conductivity of water. Changes in salinity levels can adversely affect beneficial uses, such as agricultural water supply, fish migration, and estuarine habitat.

Sediment

The concentration of suspended sediment in the water column is influenced by stream inflows, bank erosion, and the re-suspension of sediments by wind or tidal mixing. Water quality contaminants, such as metals or toxic chemicals, sequestered in bottom sediments or adjacent upland areas can adsorb (attach) to suspended sediments in the water column. Where contaminants can be adsorbed to suspended sediments, higher concentrations of suspended sediments can lead to higher concentrations of contaminants in the water. Because suspended sediments are highly mobile, they provide a transport mechanism that can cause the spreading and deposition of water quality contaminants.

Temperature

Temperature affects aquatic organisms and their biological processes. Extreme water temperatures can have deleterious effects on organism life history and reproduction, especially for sensitive species such as salmonids. Parameters that influence stream temperature include ambient air temperature, humidity, riparian vegetation, topography, surrounding land uses, and the amount of flow. Additionally, inflows from cold water seeps and from groundwater can moderate stream water temperatures. Water temperature influences a number of chemical processes within water bodies. Dissolved oxygen capacity is inversely related to water temperature.

3.13.2 Regulatory Setting

Federal Plans, Policies, Regulations, and Laws

Clean Water Act

The Clean Water Act (CWA) is the primary federal law that protects the quality of the nation's surface waters, including lakes, rivers, and coastal wetlands. The key sections of the CWA that pertain to water quality regulation are Section 303, 401, and 402 (discussed hereunder). Section 404 of the CWA regulates the discharge of dredged and fill materials into waters of the United States, and is overseen by the U.S. Environmental Protection Agency (USEPA) and the U.S. Army Corps of Engineers. Section 404 requirements are discussed further in Section 3.3, *Biological Resources*.

Section 303

Under CWA Section 303[d], states are required to identify "impaired water bodies" (those that do not meet established water quality standards), identify the pollutants causing the impairment, establish priority rankings for waters on the list, and develop a schedule for development of control plans to improve water quality. Following listing, USEPA then approves the state's recommended list of impaired waters or adds and/or removes water bodies to the list. Each Regional Water Quality Control Board (RWQCB) must update the Section 303[d] list every 2 years. Water bodies on the list have no further assimilative capacity for the identified pollutant, and the Section 303[d] List identifies priorities for development of pollution control plans for each listed water body and pollutant.

The pollution control plans triggered by the CWA Section 303[d] List are called Total Maximum Daily Loads (TMDL). The TMDL is a "pollution budget" designed to restore the

health of a polluted body of water. A TMDL is a calculation of the maximum amount of a pollutant that a water body can receive and still meet water quality standards, thereby ensuring the protection of beneficial uses. A TMDL also contains the target reductions needed to meet water quality standards and allocates those reductions among the pollutant sources in the watershed (point sources, non-point sources, and natural sources). The TMDL process quantifies water quality problems, identifies pollutant sources, and recommends pollutant load reductions or control actions needed to restore and protect the beneficial uses of the impaired water body. The calculation of a TMDL includes a margin of safety and considers seasonal variations. (40 CFR Section 130.2)

CWA Section 303 is overseen by USEPA and administered by the State Water Resources Control Board (SWRCB) and its nine RWQCBs. Once a TMDL is developed and approved by the RWQCB, SWRCB, and USEPA, the implementation plan (if included in the TMDL) can be enacted. The TMDL implementation plan includes: pollution prevention, control, and restoration actions; responsible parties; and schedules necessary to attain water quality standards. The implementation plan also identifies enforceable measures (e.g., prohibitions) and triggers for RWQCB action (e.g., performance standards). One method of TMDL enforcement utilized by states and RWQCBs is to require responsible parties to comply with pollution control actions as part of permits issued under the National Pollutant Discharge Elimination System (NPDES) program (see the CWA Section 402 discussion below). If an NPDES permit signatory, or third party covered under a signatory, is found to be out of compliance with the permit requirements, including TMDL compliance requirements, penalties may be assessed by the signatory (in the case of third party lapses) or by the state (in a case where a signatory is out of compliance, as determined by USEPA). At the state level (in California), once a TMDL is incorporated into an RWQCB's basin plan as an amendment, the California Porter-Cologne Water Quality Control Act (Porter-Cologne Act) authorizes the agency to issue Waste Discharge Requirements (WDRs) to responsible parties named in the TMDL. Discharge requirements, whether issued under CWA or Porter-Cologne Act authority, may include implementation of BMPs to meet performance standards. The current effective, USEPA-approved 303(d) list is from 2006. The SWRCB and the RWQCBs have prepared a 2008 303(d) list, but this list is not effective until USEPA approves it. Impaired water bodies identified on the current 303(d) list within the Project Area are discussed in *Surface Water Quality* under Section 3.13.3 below.

The San Francisco Bay RWQCB and the Central Coast RWQCB have prepared or are in the process of preparing TMDLs applicable to water bodies in Santa Clara County. USEPA has approved the following TMDLs that are currently implemented by the San Francisco Bay RWQCB: Guadalupe River Watershed Mercury, San Francisco Bay Mercury, San Francisco Bay polychlorinated biphenyls (PCBs), and Urban Creeks Pesticide Toxicity. USEPA-approved TMDLs within those portions of Santa Clara County under the jurisdiction of the Central Coast RWQCB include: Pajaro River Fecal Coliform (including Pajaro River, San Benito River, Llagas Creek, and Tequisquita Slough); Pajaro River Sediment (including San Benito River, Llagas Creek, and Rider Creek); and the Pajaro River Nitrate (including Llagas Creek) (Central Coast RWQCB 2010a). Additional details regarding these USEPA-approved TMDLs in the Project Area are provided below under the *State Plans, Policies, Regulations, and Laws* section. Additionally, the San Francisco Bay RWQCB is currently developing a TMDL for sediment impairment in San Francisquito Creek.

Section 401, Water Quality Certification
The goal of CWA Section 401 is to allow for evaluation of water quality when considering activities associated with dredging or placement of fill materials into waters of the United States. In California, the SWRCB and its nine RWQCBs issue water quality certifications. Each RWQCB is responsible for implementing Section 401 in compliance with the CWA and with its water quality control plan (also known as a basin plan).

Under CWA Section 401, applicants for a federal license or permit to conduct activities that may result in the discharge of dredged and fill materials into surface waters of the United States (including wetlands) must obtain a water quality certification (or Section 401 certification) to ensure that any such discharge will comply with the applicable provisions of the CWA, including Sections 301, 302, 303, 306, and 307, and state water quality standards. The water quality certification is issued by the state in which the discharge would originate; or, if appropriate, from the interstate water pollution control agency with jurisdiction over affected waters at the point where the discharge would originate. Therefore, compliance with CWA Section 401 is required for all projects that have a federal component and may affect state water quality (including projects that require federal agency approval, such as issuance of a CWA Section 404 permit).

Section 402, National Pollutant Discharge Elimination System
CWA Section 402 regulates discharges to surface waters (other than dredge or fill material) through the NPDES, administered by USEPA. The NPDES program provides for both general permits (those that cover a number of similar or related activities) and individual permits for discharges to waters of the U.S. This regulation is implemented at the state level and is further described below.

State Plans, Policies, Regulations, and Laws

California's Porter-Cologne Water Quality Control Act is the primary state regulation governing water quality. The water quality control plans (or basin plans) and policies established by the two RWQCBs with jurisdiction in the Project Area (the Central Coast and San Francisco Bay RWQCBs) are discussed below. In addition, the SWRCB also has responsibility for implementing CWA Section 402 and has established general NPDES permits for the regulation of discharges from construction, municipal, and herbicide application activities, which are also discussed below. The General NPDES Aquatic Pesticide Use permit is described in Section 3.6, *Hazards and Hazardous Materials*.

California Porter-Cologne Water Quality Act

The Porter-Cologne Act was passed in 1969, and together with the CWA, provides regulatory guidance to protect water quality and water resources. The Porter-Cologne Act established the SWRCB and divided California into nine regions, each overseen by an RWQCB. The Porter-Cologne Act established regulatory authority over "waters of the state," which are defined as "any surface water or groundwater, including saline waters, within the boundaries of the state" (California Water Code, Division 7, Section 13050). More specifically, the SWRCB and its nine RWQCBs have jurisdiction over the beds and banks of stream channels, their riparian corridors, and their beneficial uses. The Porter-Cologne Act also assigned responsibility for implementing CWA Sections 303, 401, and 402 to the SWRCB and RWQCBs.

The Porter-Cologne Act requires the development and periodic review of water quality control plans (basin plans) for the protection of water quality in each of the state's nine regions. A basin plan is unique to each region and must identify beneficial uses, establish water quality objectives for the reasonable protection of the beneficial uses, and establish a program of implementation for achieving the water quality objectives. To ensure currency, basin plans must be updated every 3 years. Basin plans must also comply with Section 303 of the CWA, which requires states to establish their own water quality standards. Basin plans provide the technical basis for the RWQCBs to determine waste discharge requirements, take enforcement actions, and evaluate grant proposals. Santa Clara County is within the jurisdiction of the San Francisco Bay Basin Plan (2007) and the Central Coast Region Basin Plan (2006a). The beneficial uses established for each surface water body and groundwater basin in the Project Area, as established in these basin plans, are provided in Table 3.13-1, located on page 3.13-13.

NPDES Construction General Permit

Construction-related stormwater discharges to waters of the U.S. are regulated under the SWRCB's General Permit for Discharges of Storm Water Associated with Construction and Land Disturbance Activities (Construction General Permit) (2009). Projects disturbing more than 1 acre of land during construction, including linear projects, are required to file a Notice of Intent and submit a Storm Water Pollution Prevention Plan to the SWRCB to be covered by the Construction General Permit before the onset of construction. Construction activities resulting in soil disturbances of less than 1 acre also are subject to the Construction General Permit, if the construction activity is part of a larger common plan of development that encompasses 1 or more acres of soil disturbance, or if significant water quality impairment will occur from the activity.

This permit does not cover linear routine maintenance projects. As defined in the permit, routine maintenance projects are projects associated with operations and maintenance activities to maintain the purpose of the facility or hydraulic capacity and that are conducted on existing lines and facilities and within existing right-of-way, easements, franchise agreements, or other legally binding agreements of the discharger. Thus, this permit does not apply to SCVWD's stream maintenance activities.

Municipal Regional Stormwater NPDES Permit

The Municipal Regional Stormwater NPDES permit (Order R2-2009-0074, NPDES Permit No. CAS612008) covers municipal stormwater discharges from the majority of Bay Area counties and cities. The permit is applicable to Santa Clara County and the following cities and agencies within the county which have joined together to form the Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVURPPP): the cities of Campbell, Cupertino, Los Altos, Milpitas, Monte Sereno, Mountain View, Palo Alto, San Jose, Santa Clara, Saratoga, and Sunnyvale; the towns of Los Altos Hills and Los Gatos; and SCVWD. Multiple provisions in the permit address the urban runoff requirements of existing TMDLs, such as the San Francisco Bay Mercury and the Bay's PCBs TMDLs. The Municipal Regional Stormwater NPDES permit establishes discharge prohibitions, annual reporting requirements, construction site controls, water quality monitoring, pesticides toxicity control, and trash load reductions. The purposes of these measures are to: control and reduce the levels of pollution in both stormwater and non-stormwater discharges to storm drains and

watercourses; gather concentration and loading information for a number of pollutants of concern for which TMDLs are planned or are in the early stages of development; and ensure the implementation of appropriate source control, site design, and stormwater treatment measures in new development and redevelopment projects (San Francisco Bay RWQCB 2009).

The SCVURPPP incorporates regulatory, monitoring, and outreach measures aimed at reducing pollution in urban runoff to the "maximum extent practicable" to improve the water quality of South San Francisco Bay and the streams of Santa Clara Valley (SCVURPPP 2010). An Urban Runoff Management Plan (URMP), prepared by the SCVURPPP, includes both an area-wide plan and individual plans that detail the actions the fifteen co-permittees will take, collectively and individually, to reduce urban runoff pollution. In addition, the URMP describes the goals, objectives, and elements of the plan so that agencies may implement them in accordance with the Municipal Regional Stormwater NPDES permit (SCVURPPP 2010). The SCVWD's SMP Update would continue to comply with the requirements detailed in the URMP, including water quality monitoring and pesticide toxicity control.

Guadalupe River Mercury TMDL

On June 1, 2010, USEPA approved a basin plan amendment to incorporate into the San Francisco Bay Basin Plan, the Guadalupe River Mercury TMDL and the implementation plan for mercury. The basin plan amendment for mercury also establishes new water quality objectives for mercury. Elevated mercury concentrations in the tissue of Guadalupe River fish pose a human health threat and a threat to wildlife. Thus, the TMDL will examine this water quality problem and provide a watershed-wide mercury management strategy. The New Almaden Mining District, the largest-producing mercury mine in North America, is the primary source of mercury in the river's watershed. Other sources include atmospheric deposition from global and local sources, soil erosion from areas not known to contain mines, urban stormwater runoff, seepage from landfills, and Central Valley Project water stored in Calero Reservoir. Implementation of the Guadalupe River Mercury TMDL also will reduce the amount of mercury in the Bay, in accordance with the San Francisco Bay Mercury TMDL's proposed requirements. (San Francisco Bay RWQCB 2010a).

The Guadalupe River Mercury TMDL requires that SCVWD conduct technical studies related to MeHg production and control. SCVWD will continue to operate, maintain, and improve the performance of, or replace with newer technology, existing MeHg controls already in place on Lake Almaden, Almaden Reservoir, and Guadalupe Reservoir. In addition, SCVWD will evaluate and test additional methods of controlling MeHg production and bioaccumulation in shallow impoundments, if implementation actions in the reservoirs and lakes do not result in attaining targets downstream. The SMP Update activities, particularly sediment removal and disposal, generally would support the MeHg control activities. (San Francisco Bay RWQCB 2010a)

San Francisco Bay Mercury TMDL

A TMDL for mercury in San Francisco Bay and an implementation plan to achieve the TMDL were incorporated as an amendment into the San Francisco Bay Basin Plan on February 12, 2008, by USEPA. The purpose of the San Francisco Bay Mercury TMDL and implementation plan is to examine the mercury water quality situation in the Bay and identify sources of mercury. Mercury sources include runoff from historic mines, urban runoff, wastewater discharges, atmospheric deposition, and resuspension of historic deposits of mercury-laden sediment already in San Francisco Bay. Most of the historic mercury deposits date back to the Gold Rush of the 1800s, when mercury was mined throughout the Coastal Range and used in the Sierra Nevada to extract gold. A mercury load allocation has been assigned to the SCVURPPP and its related urban stormwater discharges. A load allocation is applicable to SCVWD and may be applicable to the SMP Update. (San Francisco Bay RWQCB 2008)

San Francisco Bay PCB TMDL

USEPA approved a TMDL and an implementation plan for PCBs in San Francisco Bay, to be incorporated as a basin plan amendment on March 29, 2010. PCBs were manufactured in the U.S. and widely used from the late 1920s through the 1970s. Because PCBs degrade very slowly in the environment, their toxic effects are still of concern, particularly because they are toxic, persist in the environment, and accumulate in the tissue of fish, wildlife, and humans. Since 1994, the State has advised that consumption of fish from the San Francisco Bay should be limited because its fish have accumulated high levels of several pollutants, including PCBs. Implementation of the San Francisco Bay PCBs TMDL will most likely involve a phased approach to pollutant reduction and cleanup to restore the beneficial uses of the Bay (San Francisco Bay RWQCB 2010b). The SMP Update would be in compliance with the TMDL because it would not contribute any new sources of PCBs to San Francisco Bay and could remove PCBs sequestered in the stream sediment during sediment removal activities.

Urban Creeks Pesticide TMDL

Stormwater runoff, particularly of the common insecticide diazinon, has impaired the water quality of San Francisco Bay area urban creeks such that the creeks exceed water quality standards for aquatic toxicity. Diazinon is a common insecticide used throughout the Bay Area to manage a broad spectrum of pests, such as ants and grubs. A small fraction of the diazinon applied reaches surface waters, but that fraction is sufficient to result in diazinon concentrations that are toxic to test organisms. Thus, an amendment incorporating a TMDL and implementation plan for Diazinon and pesticide-related toxicity in the Bay Area's urban creeks have been incorporated into the San Francisco Bay Basin Plan. The TMDL and its implementation plan will examine this water quality problem, identify sources of diazinon, and determine and implement actions that will lead to a solution (San Francisco Bay RWQCB 2006). The Proposed Project would not use pesticides, such as diazinon, that are covered by the Urban Creeks Pesticide TMDL and, therefore, would not contribute to the TMDL.

Pajaro River Fecal Coliform TMDL

On August 3, 2010, USEPA approved the incorporation of a Pajaro River Fecal Coliform TMDL and its implementation plan as an amendment to the Central Coast Region Basin Plan (2006a). The fecal coliform TMDL applies to the Pajaro River watershed, including the Pajaro River, San Benito River, Llagas Creek, Tequisquita Slough, San Juan Creek, Carnadero/Uvas Creek, Bird Creek, Pescadero Creek, Tres Pinos Creek, Furlong (Jones) Creek, Santa Ana Creek, and Pacheco Creek. As part of the basin plan amendment, a Domestic Animal Waste Discharge Prohibition applicable to the Pajaro River watershed, and a Human Fecal Material Discharge Prohibition applicable to the Pajaro River watershed will be incorporated. The purpose of this TMDL is to protect water contact recreation in the watershed, which the current levels of fecal coliform do not support (Central Coast RWQCB 2010b). The SMP Update would be in compliance with this TMDL because the Proposed Project would not introduce new sources of fecal coliform to the Pajaro River and could remove existing sources of fecal coliform during sediment removal.

Pajaro River Sediment TMDL

The Pajaro River watershed has experienced acute erosion and sedimentation problems as a result of urban and agricultural encroachment on streams, the poor condition of drainage infrastructure (i.e., ditches, culverts, and roads), streambank instability caused by the removal and/or loss of riparian vegetation. The sediment problems were affecting the watershed's ability to support the fisheries-related beneficial uses of its water bodies, including cold, fresh water habitat, migration, and spawning. Therefore, a Pajaro River Sediment TMDL and implementation plan, applicable to the Pajaro River, Llagas Creek, Rider Creek, and San Benito River, were incorporated by USEPA as an amendment to the Central Coast Region Basin Plan in May 2007. In addition to the adoption of a Pajaro River Sediment TMDL, a Pajaro River watershed Land Disturbance Prohibition applicable to pasture and range lands, roads, animal and livestock facilities, and hydromodification-related activities that result in streambank erosion was incorporated as a basin plan amendment. The Central Coast RWQCB also will use the following mechanisms to implement the TMDLs: the existing Conditional Waiver for Discharges from Irrigated Agricultural Lands and renewal of existing Waste Discharge Requirements for sand and gravel mining operations (Central Coast RWQCB 2007). The SMP Update would not contribute additional sources of sediment and would be beneficial to the implementation of this TMDL through sediment removal.

Pajaro River Nitrate TMDL

The Pajaro River and Llagas Creek have consistent nitrate violations that impair the ability of these water bodies to support their beneficial uses for municipal and domestic water supply. The primary source of these impairments is croplands. On October 13, 2006, USEPA approved a Pajaro River Nitrate TMDL and a corresponding implementation plan to be incorporated as an amendment to the Central Coast Region Basin Plan. The Nitrate TMDL is applicable to both the Pajaro River and Llagas Creek, and sets a maximum nitrate concentration of 10 milligrams per liter as nitrogen (mg/l-N) for each receiving water body. In addition, load allocations of 10 mg/l-N have been assigned to each source, including background and all watershed land uses, such as cropland and rangeland (Central Coast

RWQCB 2006b). The SMP Update would have no effect on the Pajaro River Nitrate TMDL because it would not introduce any new nitrate sources.

Regional and Local Plans, Policies, Regulations, and Ordinances

As described above, the Santa Clara County 15 co-permittees of the Municipal Regional Stormwater NPDES permit have developed an URMP. The URMP is a San Francisco Bay area-wide permit that lists 77 co-permittees. In addition, the southern portion of Santa Clara County's jurisdiction and the cities of Gilroy and Morgan Hill have obtained their own Phase II NPDES permit coverage for municipal stormwater activities. Implementation of the Phase II permit is guided by a Stormwater Management Plan, which describes pollution prevention activities for the communities to enforce. The Proposed Project would not be directly required to comply with these permits.

3.13.3 Environmental Setting

An overview of water quality and groundwater resources in the Project Area is presented next. Descriptions of watersheds and streams in the Project Area are provided in Section 3.7, *Hydrology and Geomorphology*. A discussion of climate in the Project Area also is provided in Section 3.7.

Surface Water Quality

Ambient water quality in the Santa Clara and Pajaro River basins is influenced by numerous natural and artificial sources, including soil erosion, stormwater runoff, agriculture, recreation activities, municipal point sources, mining, and agriculture. Land uses within the Santa Clara Basin range from residential, commercial, and industrial uses in the northern portion of the basin to a primarily rural southern portion, with cattle ranching, water-supply catchments, and scattered low-density residential development uses (SCBWMI 2000). Historically, agriculture was the dominant land use in the Pajaro River Basin and a major source of nutrient and sediment loading into the Pajaro River (SWRCB 2002). However, in recent years, substantial portions of the upper Pajaro River Basin have been developed into residential subdivisions. In addition to the residential and agricultural uses, historic mercury mining activities occurred near the Hernandez Lake area and gravel mining occurred along the Pajaro River (SWRCB 2002).

According to the 2006 303(d) list of Water Quality Impaired Water Bodies, 12 water bodies in the Santa Clara Basin and three in the Pajaro River Basin have water quality impairments (see Table 3.13-2, on page 3.13-15). The most common impairments in the Santa Clara Basin are mercury and diazinon. Both of these impairments are currently being addressed by adopted TMDLs for the San Francisco Bay and for urban creeks in the Bay Area. In the Pajaro River Basin, the primary impairments are nutrients, fecal coliform, and sediments, which also are currently being addressed by adopted TMDLs.

SMP Water Quality Monitoring

As part of its implementation of the existing SMP, SCVWD removed sediment from approximately 37 creeks, rivers, canals, or channels in the Project Area from 2007 through 2009, the most recent years for which data are available. SCVWD has been conducting water quality monitoring as required by permits (Order R2-2002-0028 and Order R3-2002-0008) issued by the San Francisco ~~Bay~~ and Central Coast Regional Water Quality Boards for the multi-year sediment removal program. As part of the SMP Update, these permits are in the process of being revised along with the associated Water Quality Monitoring Plans. Once updated and approved, these Water Quality Monitoring Plans will be incorporated into the final 2012–2022 SMP Update. In general, turbidity, water temperature, dissolved oxygen, and pH were monitored upstream and downstream of any in-channel water diversions before, during, and following sediment removal activities in creeks. During 2007, the removal of approximately 33,523 cubic yards of sediment from 17 project sites on 15 creeks did not result in any water quality exceedances, unplanned releases, or episodes of noncompliance with permits (SCVWD 2008). The 2008 sediment removal activities removed 8,845 cubic yards of sediment from 14 project sites on 13 water bodies and did not result in any water quality exceedances, unplanned releases, or episodes of non-compliance (SCVWD 2009).

Approximately 13,163 cubic yards of sediment and other material were removed during the 2009 sampling activities from 17 sites on 9 surface water bodies. In 2009, four water quality exceedances related to pH (fluctuations that occurred because of influences beyond the SMP) or turbidity occurred during the sediment removal and streamflow diversion activities. The pH exceedances did not require intervention because they were observed upstream of the work area and, therefore, were not related to SMP activities. The turbidity exceedances occurred as a result of a bypass pump shut down and adjustment of a stream bypass. However, subsequent protocol sampling indicated that the exceedances were resolved. No other unplanned or noncompliance issues occurred during 2009. (SCVWD 2010)

SMP Sediment Sampling

In addition to its water quality monitoring, SCVWD has sampled the sediments removed as part of its SMP implementation. Similar to the Water Quality Monitoring Plans discussed above, the existing Sediment Characterization Plans associated with the RWQCB permits are being revised, and once approved, will be incorporated into the final 2012–2022 SMP Update. Sediment sampling is undertaken to: comply with SCVWD's current WDRs; characterize the sediments to establish if they are suitable for reuse as a construction material ("foundation limit"), a topsoil or soil amendment ("surface limit"); and determine what type of disposal may be required (e.g. reuse, landfill, hazardous waste collection site). An exceedance of a "hazardous limit" indicates that the soil should be considered hazardous waste.

In 2009 and 2010, SCVWD analyzed sediments that were removed as part of the SMP for total and dissolved metals, dissolved and total mercury, PCBs, polycyclic aromatic hydrocarbons (PAHs), and pesticides. Criteria to determine if a soil was considered a hazardous waste were established for Total PCBs; dissolved and total metals, including mercury; and nine pesticides. Soil samples were analyzed to determine if constituents

exceeded the "surface limit," "foundation limit," and hazardous waste limits. No hazardous waste criteria have yet been established for the PAHs, or for most of the PCBs and pesticides analyzed. Dissolved and total metals included analysis for: antimony, arsenic, barium, beryllium, cadmium, chromium, cobalt, copper, lead, molybdenum, nickel, selenium, silver, thallium, vanadium, and zinc. Twenty-six PAHs were analyzed by SCVWD. The nine analyzed pesticides with hazardous waste threshold criteria included: aldrin, dieldrin, endrin, methoxychlor, total chlordane, total "DDTs" total heptachlor, toxaphene, and gamma-BHC (lindane). Total "DDTs" analyzes the total quantity of the chemicals dichloro-diphenyl-trichloroethane (DDT), dichlorodiphenyldichloroethylene (DDE), and dichlorodiphenyldichloroethane (DDD). DDE and DDD can enter the environment as breakdown products of DDT (ATSDR 2002).

As shown in Table 3.13-3 on page 3.13-19, the results of the 2009 and 2010 monitoring indicate that most surface water bodies had at least one impairment that would generally make the sediments unsuitable for topsoil or soil amendment use. Numerous surface waters also had sediments with constituents that exceeded the foundation limit thresholds. Hazardous waste impairments were only recorded once each year (for the Coyote-Alamitos Canal and the Guadalupe River) and both for chromium impairments. The most common impairments were for the pesticides Total Chlordane and Total DDTs and/or for total metals, including mercury.

Table 3.13-1. Beneficial Uses for Surface Water Bodies and Groundwater Basins in the Project Area

Water Body	Beneficial Uses[1]																		
	AGR	MUN	FRSH	GWR	IND	PROC	COMM	SHELL	COLD	EST	MAR	MIGR	RARE	SPWN	WARM	WILD	REC1	REC2	NAV
Santa Clara Basin																			
Calabazas Creek	E			E					E						E	E	E	E	
Coyote Creek				E					E			E	E	E	E	E	P	E	
Guadalupe Reservoir		E		E					E					E	E	E	E	E	
Los Gatos Creek		E	E	E					E			P		P	E	E		P	
Matadero Creek									E			E		E	E	E	E	E	
Permanente Creek									E					E		E	E	E	
San Francisquito Creek									E			E		E	E	E	P	P	
San Francisco Bay (South)					E		E	E		E		E	E	P		E	E	E	E
Saratoga Creek	E		E	E					E						E	E	E	E	
Smith Creek		E	E						E					E	E	E	E	E	
Stevens Creek			E						E			E		P	E	E	E	E	
Pajaro River Basin																			
Carnadero Creek		E		E			E		E			E	E		E	E	E	E	
Llagas Creek (above Chesbro Reservoir)	E	E	E	E			E		E				E		E	E	E	E	
Llagas Creek (below Chesbro Reservoir)	E	E		E	E		E		E			E	E	E	E	E	E	E	
Little Llagas Creek	E	E		E			E								E	E	E	E	
Pajaro River	E	E	E	E	E		E		E			E		E	E	E	E	E	
Uvas Creek, downstream	E	E		E	E		E		E			E	E	E	E	E	E	E	

Table 3.13-1. Beneficial Uses for Surface Water Bodies and Groundwater Basins in the Project Area

Water Body	Beneficial Uses[1]																		
	AGR	MUN	FRSH	GWR	IND	PROC	COMM	SHELL	COLD	EST	MAR	MIGR	RARE	SPWN	WARM	WILD	REC1	REC2	NAV
Groundwater Basins (Sub-Basin)																			
Santa Clara Valley (Santa Clara)	E	E			E	E													
Gilroy-Hollister Valley (Llagas Area)	E	E			E														

1 Beneficial uses are defined as:
Agr = Agricultural Supply; COLD = Cold Freshwater Habitat; COMM = Ocean, Commercial, and Sport Fishing; EST = Estuarine Habitat;
FRSH = Freshwater Replenishment; GWR = Groundwater Recharge; IND = Industrial Service Supply; MAR = Marine Habitat;
MIGR= Fish Migration; MUN = Municipal and Domestic Supply; NAV = Navigation; PRO = Industrial Process Supply;
RARE = Preservation of Rare and Endangered Species; REC1 = Water Contact Recreation; REC2 = Non-contact Water Recreation;
SHELL = Shellfish Harvesting; SPWN = Fish Spawning; WARM = Warm Freshwater Habitat; WILD = Wildlife Habitat;
E = existing beneficial use; P = potential beneficial use
Note: The basin plans do not include beneficial uses for all water bodies included in the Project Area. In addition, the Guadalupe Reservoir and San Francisco Bay (South) have been included for clarity although no activities would be performed in these water bodies under the Proposed Project..

Sources: San Francisco Bay RWQCB 2007, Central Coast RWQCB 2006a

Table 3.13-2. 303(d) List of Impaired Water Bodies and their Impairments in the Project Area

Water Body	TMDL Requirement Status[1]	Estimated Stream Length Affected (miles)	Pollutant	Pollutant Category	Potential Sources
Santa Clara Basin					
South San Francisco Bay	B (Mercury, PCBs), R[2]	9,204[3]	1. Chlordane 2. DDT 3. Dieldrin 4. Dioxin Compounds 5. Exotic Species 6. Furan Compounds 7. Mercury 8. PCBs 9. Selenium	1. Pesticides 2. Pesticides 3. Pesticides 4. Other Organics 5. Misc. 6. Other Organics 7. Metals/Metalloids 8. Other Organics 9. Metals/Metalloids	1. Nonpoint Source 2. Nonpoint Source 3. Nonpoint Source 4. Atmospheric Deposition 5. Ballast Water 6. Atmospheric Deposition 7. Atmospheric Deposition, Industrial, Municipal, and Natural Point Sources, Nonpoint Sources, Resource Extraction 8. Unknown Nonpoint Source 9. Agriculture, Domestic Use of Groundwater
Lower Peninsula Watershed					
Matadero Creek	B	7.3	Diazinon	Pesticides	Urban Runoff, Storm Sewers
Permanente Creek	B	13	Diazinon	Pesticides	Urban Runoff, Storm Sewers
San Francisquito Creek	B (Diazinon), R (Sediment)	12	1. Diazinon 2. Sedimentation/Siltation	1. Pesticides 2. Sediment	1. Urban Runoff, Storm Sewers 2. Nonpoint Source
Stevens Creek	B (Diazinon), R (Toxicity)	20	1. Diazinon 2. Toxicity	1. Pesticides 2. Toxicity	1. Urban Runoff, Storm Sewers 2. Source Unknown

Table 3.13-2. 303(d) List of Impaired Water Bodies and their Impairments in the Project Area

Water Body	TMDL Requirement Status[1]	Estimated Stream Length Affected (miles)	Pollutant	Pollutant Category	Potential Sources
Coyote Watershed					
Coyote Creek (Santa Clara Co.)	B	55	Diazinon	Pesticides	Urban Runoff, Storm Sewers
West Valley Watershed					
Calabazas Creek	B	4.7	Diazinon	Pesticides	Urban Runoff, Storm Sewers
Saratoga Creek	B	18	Diazinon	Pesticides	Urban Runoff, Storm Sewers
Guadalupe Watershed					
Alamitos Creek	R	7.1	Mercury	Metals/Metalloids	Mine Tailings
Guadalupe Creek	R	8.1	Mercury	Metals/Metalloids	Mine Tailings
Guadalupe River	B[2]	18	1. Diazinon 2. Mercury	1. Pesticides 2. Metals/Metalloids	1. Urban Runoff, Storm Sewers 2. Mine Tailings
Los Gatos Creek	B	19	Diazinon	Pesticides	Urban Runoff, Storm Sewers
Pajaro River Basin					
Corralitos Creek	R	13	Fecal Coliform	Pathogens	Source Unknown

Table 3.13-2. 303(d) List of Impaired Water Bodies and their Impairments in the Project Area

Water Body	TMDL Requirement Status[1]	Estimated Stream Length Affected (miles)	Pollutant	Pollutant Category	Potential Sources
Llagas Creek	R (Chloride, Fecal Coliform, Dissolved Oxygen, pH, Sodium, TDS[4], B (Nitrate, Nutrients, Sedimentation/Siltation)	16	1. Nitrate 2. Nutrients 3. pH 4. Sedimentation/Siltation 5. Sodium 6. TDS[4]	1. Nutrients 2. Nutrients 3. Misc. 4. Sediment 5. Salinity 6. Salinity	1. Source Unknown 2. Agriculture (Agricultural Return Flows, Irrigation tailwater), Habitat Modification, Irrigated Crop Production, Municipal Point Sources, Nonpoint Source, Pasture Grazing, Unknown point source, Urban Runoff, Storm Sewers 3. Source Unknown 4. Agriculture, Habitat Modification, Hydromodification 5. Nonpoint Source 6. Nonpoint Source, Point Source

Table 3.13-2. 303(d) List of Impaired Water Bodies and their Impairments in the Project Area

Water Body	TMDL Requirement Status[1]	Estimated Stream Length Affected (miles)	Pollutant	Pollutant Category	Potential Sources
Pajaro River	B	32	1. Fecal Coliform 2. Nitrate 3. Nutrients 4. Sedimentation/Siltation	1. Pathogens 2. Nutrients 3. Nutrients 4. Sediment	1. Natural and Nonpoint Sources, Pasture Grazing 2. Source Unknown 3. Agriculture (Agricultural Return Flows, Irrigation Tailwater, Storm Runoff), Channelization, Irrigated Crop Production, Nonpoint Source, Removal of Riparian Vegetation, Urban Runoff, Storm Sewers, Wastewater land disposal 4. Agriculture (Storm Runoff), Channel Erosion, Channelization, Habitat Modification, Hydromodification, Irrigated Crop Production, Range Grazing, Removal of Riparian Vegetation, Resource Extraction, Streambank Modification or Destabilization, Surface Mining.

[1] TMDL status abbreviations are: B = Being Addressed by a USEPA-approved TMDL, R = a TMDL is still required.
[2] The 2006 303(d) list indicates that a TMDL is still required for Mercury. However, a TMDL has been developed since the publication of the list in 2007.
[3] Units are in acres instead of miles.
[4] TDS=total dissolved solids

Sources: SWRCB 2007; San Francisco Bay RWQCB 2006, 2008, 2010a, 2010b

Table 3.13-3. Exceedances of Sediment Constituent Thresholds by Surface Water Body for Sediments Removed as part of the SMP in 2009 and 2010

Surface Water from which Sediment was Collected	Threshold Types[1,2]		
	Surface Limit	Foundation Limit	Hazard Limit
2009[3]			
Alamitos Creek	Total Mercury, Total Metals (Chromium, Nickel)	Total Mercury, Total Metals (Nickel)	NR
Almaden-Calero Canal	Total Mercury, Total Metals (Chromium, Nickel)	Total Mercury, Total Metals (Chromium, Nickel)	NR
Calera Creek	Pesticides (Total Chlordane), Total Metals (Selenium)	NR	NR
Canoas Creek	Pesticides (Total Chlordane, Total DDTs), Total Mercury, Total Metals (Nickel, Selenium, Zinc), Polyaromatic hydrocarbons (PAHs) (Acenaphthene, Anthracine, Benzo(a)anthracine, Benzo(a)fluoranthene, Benzo(a)pyrene, Benzoperylene, Chrysene, Dibenzanthracene, Fluoranthene, Fluorene, Pyrene, Total PAH)	Pesticides (Total Chlordane), Total Mercury, Total Metals (Nickel)	NR
Guadalupe Creek	Total Mercury, Total Metals (Cadmium, Chromium, Nickel)	Total Metals (Nickel)	NR
Guadalupe River	Pesticides (Total Chlordane, Total DDTs), Total Mercury, Total Metals (Cadmium, Chromium, Copper, Lead, Nickel, Selenium, Zinc), Total PCB	Pesticides (Total Chlordane), Total Mercury, Total Metals (Nickel, Zinc)	Dissolved Metals (Chromium)
Los Coches Creek	PAHs (Acenaphthene, Dibenzanthracene, Fluorene, Phenanthrene), Pesticides (Total Chlordane, Total DDTs)	Pesticides (Total Chlordane)	NR
Lower Penitencia Creek	Total Metals (Cadmium, Silver, Zinc)	NR	NR
Lower Silver Creek	Pesticides (Total Chlordane)	NR	NR
Matadero Creek	Pesticides (Total Chlordane, Total DDTs), Total Metals (Selenium)	Pesticides (Total Chlordane)	NR
North Morey Channel	Total Mercury	Total Mercury	NR

Table 3.13-3. Exceedances of Sediment Constituent Thresholds by Surface Water Body for Sediments Removed as part of the SMP in 2009 and 2010

Surface Water from which Sediment was Collected	Threshold Types[1,2]		
	Surface Limit	**Foundation Limit**	**Hazard Limit**
Penitencia East Channel	Pesticides (Total Chlordane), Total Metals (Selenium)	Pesticides (Total Chlordane)	NR
Permanente Creek	Total Metals (Cadmium, Selenium)	NR	NR
San Tomas Aquino Creek	PAH (Naphthalene), Pesticides (Total Chlordane, Total DDTs), Total Metals (Cadmium, Selenium)	PAH (Naphthalene), Pesticides (Total Chlordane)	NR
Saratoga Creek	Total Metals (Cadmium)	NR	NR
Sierra Creek	Pesticides (Total Chlordane, Total DDTs), Total Metals (Cadmium, Lead)	Pesticides (Total Chlordane, Total DDTs)	NR
Tennant Creek	Total Metals (Nickel)	Total Metals (Nickel)	NR
Tularcitos Creek	Pesticides (Total Chlordane, Total DDTs), Total Metals (Cadmium)	Pesticides (Total Chlordane)	NR
Upper Penitencia Creek	Pesticides (Total DDTs), Total Metals (Selenium)	NR	NR
2010[4]			
Adobe Creek	Pesticides (Dieldrin), Total Metals, (Cadmium)	NR	NR
Almaden-Calero Canal	Pesticides (Dieldrin, Hexachlorobenzene, Total DDTs), Total Mercury, Total Metals (Chromium, Nickel)	Total Mercury, Total Metals (Chromium, Nickel)	NR
Berryessa Creek	Pesticides (Dieldrin, Total Chlordane, Total DDTs), Total Metals (Nickel)	Pesticides (Total Chlordane), Total Metals (Nickel)	NR
Calera Creek	Pesticides (Total DDTs), Total Metals (Cadmium)	NR	NR
Canoas Creek	PAHs (Dibenz(a,h)anthracene, Phenanthrene), Pesticides (Total Chlordane, Total DDTs), Total Metals (Cadmium, Chromium, Nickel, Selenium)	Pesticides (Total Chlordane), Total Metals (Nickel)	NR
Coyote-Alamitos Canal	Total Metals (Cadmium, Chromium, Copper, Nickel, Selenium, Zinc), Total PCBs	Total Metals (Chromium, Nickel)	Total Metals (Chromium)
Coyote Bypass	Pesticides (Total DDTs)	NR	NR
Guadalupe Creek	Pesticides (Hexachlorocyclohexane, Total Chlordane),	Pesticides (Total Chlordane), Total	NR

Table 3.13-3. Exceedances of Sediment Constituent Thresholds by Surface Water Body for Sediments Removed as part of the SMP in 2009 and 2010

Surface Water from which Sediment was Collected	Threshold Types[1,2]		
	Surface Limit	Foundation Limit	Hazard Limit
	Total Mercury, Total Metals (Zinc)	Mercury	
Guadalupe River	PAHs (1-Methylnaphthalene, 1-methylphenanthrene, 2,6-Dimethylnaphthalene, Acenaphthene, Anthracene, Benzo(a)pyrene, Benzo(a)anthracene, Benzo(b)fluoranthene, Benzo(g,h,i)perylene, Benzo(k)fluoranthene, Benzo(e)pyrene, Biphenyl, Chrysene, Dibenz(a,h)anthracene, Fluoranthene, Fluorene, Indeno(1,2,3-cd)pyrene, Naphthalene, Perylene, Phenanthrene, Pyrene, Total PAHs), Pesticides (Total Chlordane, Total DDTs), Total Mercury, Total Metals (Cadmium, Selenium)	PAHs (Acenaphthene, Anthracene, Benzo(a)pyrene, Benzo(a)anthracene, Chrysene, Dibenz(a,h)anthracene, Fluoranthene, Fluorene, Phenanthrene, Pyrene, Total PAHs), Pesticides (Total Chlordane), Total Mercury,	NR
Los Coches Creek	Total Metals (Selenium)	NR	NR
Matadero Creek	Total Metals (Cadmium, Selenium)	NR	NR
Miguelita Creek	Pesticides (Total Chlordane, Total DDTs), Total Metals (Zinc)	NR	NR
Norwood Creek	Pesticides (Dieldrin, Hexachlorobenzene, Total Chlordane, Total DDTs), Total Metals (Cadmium, Zinc)	NR	NR
Permanente Diversion Channel	PAHs (1-Methylnaphthalene, 2,3,5-Trimethylnaphthalene, 2,6-Dimethylnaphthalene, 2-Methylnaphthalene), Pesticides (Total Chlordane, Dieldrin, Total DDTs), Total Metals (Cadmium, Selenium)	Pesticides (Total Chlordane)	NR
Quimby Creek	PAHs (2,3,5-Trimethylnaphthalene), Pesticides (Total Chlordane, Dieldrin, Total DDTs, Hexachlorobenzene, Hexachlorocyclohexane), Total Mercury, Total Metals (Cadmium, Copper, Selenium, Zinc), Total PCB	Pesticides (Total Chlordane)	NR
Ross Creek	Pesticides (Total Chlordane, Dieldrin, Total DDTs, Hexachlorobenzene), Total Mercury, Total Metals	Pesticides (Total Chlordane), Total Metals (Nickel)	NR

Table 3.13-3. Exceedances of Sediment Constituent Thresholds by Surface Water Body for Sediments Removed as part of the SMP in 2009 and 2010

Surface Water from which Sediment was Collected	Threshold Types[1,2]		
	Surface Limit	Foundation Limit	Hazard Limit
	(Cadmium, Chromium, Nickel, Selenium)		
San Tomas Aquino Creek	PAHs (Benzo(a)pyrene, Benzo(a)anthracene, Benzo(b)fluoranthene, Benzo(g,h,i)perylene, Benzo(e)pyrene, Chrysene, Dibenz(a,h)anthracene, Total PAH), Pesticides (Dieldrin, Total DDTs), Total Metals (Selenium)	NR	NR
Sierra Creek	Pesticides (Total Chlordane, Total DDTs), Total Metals (Selenium)	Pesticides (Total Chlordane)	NR
South East Santa Teresa Creek	Total Metals (Cadmium, Chromium, Nickel, Selenium)	Total Metals (Nickel)	NR
Stevens Creek	PCBs (Total PCBs), Pesticides (Total Chlordane), Total Metals (Selenium)	NR	NR
West Little Llagas Creek	Pesticides (Hexachlorocyclohexane, Total Chlordane), Total Metals (Zinc)	Pesticides (Total Chlordane)	NR

NR = no exceedances were recorded.
1 = A constituent is listed above if at least one exceedance occurred for its designated threshold in that limit category.
2 = Not all constituents analyzed have designated limits in each threshold category. Some pesticide and PCB constituents do not have any limits.
3 = Madrone Creek's sediments also were analyzed in 2009 but did not exceed any thresholds.
4 = Saratoga Creek's sediments also were analyzed in 2010 but did not exceed any thresholds.

Sources: SCVWD 2009, 2010

Groundwater Quality

Two groundwater subbasins underlie the Project Area: the Santa Clara subbasin (Santa Clara Valley groundwater basin) and the Llagas subbasin (part of the Gilroy-Hollister groundwater basin).

The Santa Clara subbasin has an area of 153,600 acres (240 square miles) and is located within a structural trough parallel to the northwest-trending Coast Ranges. The subbasin extends from the Santa Clara County northern border to the groundwater divide near the town of Morgan Hill and is bound on the east by the Diablo Range and on the west by the Santa Cruz Mountains. Groundwater flows in the subbasin generally are to the north to San Francisco Bay. Groundwater levels within the subbasin declined by as much as 200 feet during the early 1900s through the mid-1960s, as a result of groundwater pumping. However, artificial recharge programs and decreases in pumping since 1965 generally have resulted in increases in groundwater levels. (DWR 2004)

In the Santa Clara subbasin, the groundwater is generally of a bicarbonate type, with sodium and calcium being the principal cations. Although hard, the water quality in the subbasin has good to excellent mineral composition and is suitable for most uses. Some areas within the northern portion of the subbasin have somewhat elevated mineral levels that may be associated with historical saltwater intrusion. Some areas in the southern portion of the subbasin have nitrate impairments. Other impairments in the Santa Clara subbasin include primary and secondary inorganics, nitrates, volatile organic compounds, semi-volatile organic compounds, radiological constituents, and pesticides. Most wells in the subbasin are not impaired. The most frequently observed impairment in wells in the subbasin was for secondary inorganics, which exceeded its maximum contaminant level standard in 29 out of 257 wells (approximately 11 percent). (DWR 2004)

The Llagas subbasin extends from the groundwater divide at Cochran Road near the town of Morgan Hill in the north to the Pajaro River in the south and is bounded by the Diablo Range on the east and Santa Cruz Mountains on the west. The total area of the subbasin is approximately 56,000 acres (87 square miles). The Llagas subbasin drains to the south and ultimately to the Pajaro River through the river's tributaries, including Uvas and Llagas creeks. From 1969 through 2001, groundwater elevations in the Llagas subbasin remained fairly stable, except for declines and subsequent recoveries associated with the 1976–1977 and 1987–1992 drought periods. (DWR 2004)

Groundwater quality in the Llagas subbasin is generally hard[1] but of sufficient quality to support most beneficial uses. However, nitrate concentrations have been increasing and exceed the federal water quality standards in numerous private wells. Public wells have not been impaired by nitrates. Other impairments in the Llagas subbasin include primary and secondary inorganics, and pesticides. (DWR 2004)

[1] Hardness is caused by calcium and magnesium compounds and a variety of other metals. Hardness classifications are generally based on the following guidelines: 0 to 60 mg/L (milligrams per liter) as calcium carbonate is classified as soft; 61 to 120 mg/L as moderately hard; 121 to 180 mg/L as hard; and more than 180 mg/L as very hard. Hard water may be less desirable for domestic or industrial water supply beneficial uses because it requires more soap and synthetic detergents for laundry and washing, and contributes to scaling in boilers and industrial equipment. (U.S. Geological Survey 2009)

3.13.4 Impact Analysis

Methodology

The methodology used to assess possible water quality impacts that could be caused by the Proposed Project utilized the following water quality standards and requirements:

1. Beneficial uses and water quality objectives established by the San Francisco and Central Coast RWQCBs
2. Approved TMDLs
3. Local discharge requirements as issued in NPDES permits (municipal and aquatic pesticide use general permit)

Potential impacts to water quality were assessed qualitatively, based on the degree to which the proposed maintenance activities could result in violations of water quality standards, impairment of beneficial uses, or water quality conditions that could be harmful to aquatic life or human health. Each of these potential impacts (and beneficial outcomes, as applicable) is discussed below. Potential temporary and permanent impacts from the primary maintenance activities (sediment removal, vegetation maintenance, and bank stabilization) were evaluated based on the beneficial uses and existing impairments established by the San Francisco Bay and Central Coast RWQCBs, as shown in Tables 3.13-1 and 3.13-2.

Criteria for Determining Significance

For the purposes of this analysis, the Proposed Project would result in a significant impact on water quality if it would:

A. Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality; or

B. Create or contribute substantial additional sources of polluted runoff.

Environmental Impacts

Impact WQ-1: Water Quality Degradation Resulting in Violation of Water Quality Standards or Waste Discharge Requirements Caused by Ground–Disturbing Activities (Significance Criterion A; Less than Significant)

Disturbing soil on the banks and within the beds of surface water bodies could cause sediment to be eroded and transported downstream. Adverse effects of accidental sediment releases could include increased turbidity, which could cause an increase in water temperature and a corresponding decrease in dissolved oxygen levels. Increased turbidity and water temperatures, and lower dissolved oxygen levels could potentially exceed water quality standards and impair beneficial uses. Where required, the applicable Water Quality Monitoring and/or Sediment Characterization plans will be implemented as specified by the RWQCB permits.

Bank Stabilization

Bank stabilization activities would disturb bank soils and streambeds through the implementation of "hard" (e.g., concrete) or "soft" structures (e.g., pole-plantings), and through the potential creation of temporary access roads or ramps for these activities. In the long term, bank stabilization activities would reduce potential erosion and sediment transport to streams by rectifying active sources of erosion. However, during the rainy season following the bank stabilization activities, sediment inputs to surface waters could occur in pulses during and after storm events. During these events, higher levels of turbidity in the water column could result from exposed bare soils on channel banks where vegetation had not yet become established, or caused by material eroded from the recently maintained channel. Increased turbidity from storm events following maintenance activities may impair beneficial uses in the Project Area, resulting in an adverse impact.

Sediment Removal

Sediment removal activities would disturb streambeds or bank soils by the use of heavy equipment to remove sediments. Sediment removal activities would result in similar effects as those described above for bank stabilization activities and would potentially result in short-term adverse impacts on stream channel water quality.

Vegetation Management

Grazing activities, vegetation removal, and discing for vegetation management also would potentially create erosion and be a potential source for sediment transport to streams.

Management of Animal Conflicts

Management of animal conflicts generally would not involve activities that would disturb soils except for minor physical alterations to the water bodies, such as levee compaction or reconstruction, and habitat modification activities (i.e., discing).

Minor Maintenance Activities

Minor maintenance activities would potentially include grading activities or sediment removal activities that could cause sediments to be transported downstream. The potential effects would be similar to those described for sediment removal and bank stabilization activities but on a much smaller scale because of the limited acreages and sediment volumes of minor maintenance activities.

Canal Maintenance

Because routine canal maintenance activities would include all general work activities, effects would be the same as described above for other routine maintenance work.

Applicable Best Management Practices

The following BMPs would be implemented as part of the SMP Update to minimize the potential for water quality degradation resulting in violation of water quality standards or waste discharge requirements caused by ground-disturbing activities. Descriptions of each BMP are provided in Chapter 2, *Project Description*.

BMP GEN-1: In-Channel Work Window
BMP GEN-4: Minimize the Area of Disturbance
BMP GEN-16: In-Channel Minor Activities
BMP GEN-20: Erosion and Sediment Control Measures
BMP GEN-23: Stream Access
BMP GEN-30: Vehicle and Equipment Maintenance
BMP SED-1: Groundwater Management
BMP SED-2: Prevent Scour Downstream of Sediment Removal
BMP SED-3: Restore Channel Features
BMP SED-4: Berm Bypass
BMP VEG-1: Minimize Local Erosion Increase from In-Channel Vegetation Removal
BMP VEG-3: Use Appropriate Equipment for Instream Removal
BMP BANK-1: Bank Stabilization Design to Prevent Erosion Downstream
BMP BANK-3: Bank Stabilization Post-Construction Maintenance
BMP REVEG-1: Seeding
BMP REVEG-2: Planting Material

Conclusion

With the implementation of these BMPs, impacts related to water quality degradation caused by ground–disturbing Proposed Project activities would be less than significant and would not require mitigation.

Mitigation Measures: No mitigation is required.

Impact WQ-2: Water Quality Degradation Resulting in Violation of Water Quality Standards or Waste Discharge Requirements Caused by Instream Maintenance Activities (Significance Criterion A; Less than Significant)

The Proposed Project activities may be located in waters subject to tidal flows or water bodies with flowing water. As a result, SCVWD may need to prevent inundation by tidal flows and divert flowing water around the proposed maintenance activities by placement of dewatering systems and cofferdams. Where required, the applicable Water Quality Monitoring and/or Sediment Characterization plans will be implemented as specified by the RWQCB permits. The use and potential effects of these systems for each of the Proposed Project's maintenance activities are described below.

Sediment Removal/Bank Stabilization Activities

Sediment removal and bank stabilization activities would be performed within stream channels and may require the use of dewatering systems and cofferdams. Several water

quality impacts could occur during the installation, operation, and removal of dewatering systems. Installation and removal of flow diversion structures would involve streambed and bank disturbance that could cause increased turbidity in the water column surrounding a work site and could cause migration of sediment downstream. In very unlikely cases, temporary instream cofferdams constructed in the channel could fail and release sediment, sand, gravel, and water into the work site and downstream. If flow bypass mechanisms were not properly maintained, they could displace sediment at the intake and increase turbidity locally from the discharged water. If the outlet discharge from the bypass pipe was not secured properly or energy dissipaters were not used at the discharge point, erosion at the work site could occur. If pollutants from maintenance equipment were spilled into temporarily stored water or within the work site, water quality also could be degraded.

Vegetation Management/Minor Maintenance Activities/Management of Animal Conflicts

Vegetation management activities, including mowing or pruning activities, could be performed instream and may require the use of dewatering systems and cofferdams, particularly in tidally-influenced areas. Streamflow diversions also may be necessary for the minor in-channel sediment or debris removal as part of minor maintenance activities. Management of animal conflicts generally would not require the use of streamflow diversions except for any activities related to physical facility alterations, such as reconstruction of levee side slopes or levee face compaction. Potential effects of the use of dewatering systems for any of these activities would be similar to those described for sediment removal/bank stabilization activities.

Canal Maintenance

Because routine canal maintenance activities would include all general work activities, effects would be the same as described above for other routine maintenance work.

Applicable Best Management Practices

The following BMPs would be implemented as part of the SMP Update to minimize the potential for water quality degradation. Descriptions of each BMP are provided in Chapter 2, *Project Description*.

BMP GEN-33: Dewatering for Non-Tidal Sites
BMP GEN-34: Dewatering in Tidal Work Areas
BMP GEN-35: Pump/Generator Operations and Maintenance
BMP SED-1: Groundwater Management

Conclusion

With the implementation of these BMPs, impacts related to water quality degradation caused by instream maintenance activities would be less than significant and would not require mitigation.

Mitigation Measures: No mitigation is required.

Impact WQ-3: Water Quality Degradation Resulting in Violation of Water Quality Standards or Waste Discharge Requirements Caused by the Accidental Release of Hazardous Materials (Significance Criterion A; Less than Significant)

The Proposed Project includes activities that would require the use of heavy equipment, which could result in accidental releases of hazardous materials and subsequent effects on stream water quality as described below. Where required, the applicable Water Quality Monitoring and/or Sediment Characterization plans will be implemented as specified by the RWQCB permits.

Vegetation Management/Bank Stabilization/Sediment Removal Activities

Vegetation removal activities using machinery, including mechanical removal and flaming, sediment removal and bank stabilization activities, and sediment disposal/reuse activities would require the use of heavy machinery at the top of channel banks or within the stream channel. During these maintenance activities, equipment and worker vehicles would be stored and refueled in staging areas adjacent to the stream channel unless equipment stationed in these locations could not be readily relocated. The storage and refueling of equipment and vehicles could release hazardous materials, such as petroleum products. If accidentally released directly or indirectly into the stream channel, the sediment and water nearby the work site could be significantly degraded. Fine sediments within stream channels could readily absorb pollutants and be transported downstream. In addition, some bank stabilization activities would involve the use of concrete products that, if released, would affect downstream water quality.

Minor Maintenance/Management of Animal Conflicts

Minor maintenance activities may include grading or minor sediment removal activities that would require the use of heavy equipment. Similarly, management of animal conflicts could require the use of heavy equipment for any physical facility alterations, such as levee face compaction or levee side slope reconstruction. The use of heavy equipment and vehicles for these activities would result in potential effects on water quality, similar to those described for bank stabilization, vegetation management, and sediment removal activities.

Canal Maintenance

Because routine canal maintenance activities would include all general work activities, effects would be the same as described above for other routine maintenance work.

Applicable Best Management Practices

The following BMPs would be implemented as part of the SMP Update to minimize the potential for water quality degradation. Descriptions of each BMP are provided in Chapter 2, *Project Description*.

BMP GEN-24: On-Site Hazardous Materials Management
BMP GEN-25: Existing Hazardous Materials
BMP GEN-26: Spill Prevention and Response

BMP GEN-30: Vehicle and Equipment Maintenance
BMP GEN-31: Vehicle Cleaning
BMP GEN-32: Vehicle and Equipment Fueling
BMP BANK-2: Concrete Use near Waterways

Conclusion

Impacts related to water quality degradation resulting in violation of water quality standards or waste discharge requirements caused by the accidental release of hazardous materials resulting from the Proposed Project would be less than significant and would not require mitigation.

Mitigation Measures: No mitigation is required.

Impact WQ-4: Water Quality Degradation Resulting in Violation of Water Quality Standards or Waste Discharge Requirements Caused by the Use of Pesticides, including Herbicides (Significance Criterion A; Less than Significant)

The use of pesticides, including herbicides, by the Proposed Project could result in potential violations of water quality standards or waste discharge requirements, if the pesticides were improperly applied, spilled into local water bodies, or transported to groundwater. Where required, the applicable Water Quality Monitoring and/or Sediment Characterization plans will be implemented as specified by the RWQCB permits.

Vegetation Management/Canal Maintenance

SCVWD's application of herbicides directly to water, particularly in canals managed under the Proposed Project, would continue to comply with requirements of the NPDES General Permit for Aquatic Pesticide Use (see Section 3.6, *Hazards and Hazardous Materials*). This permit would require compliance with effluent limitations, including developing and implementing an Aquatic Pesticide Application Plan, as well as compliance with applicable receiving water limitations (SWRCB 2006). Compliance also would include following specific monitoring requirements, and SCVWD would follow all pesticide label instructions and any terms contained in use permits issued by the County Agricultural Commissioner. In addition, SCVWD would follow the requirement that applicators of a pesticide designated as a restricted material would need to be licensed by CDPR or work under the supervision of someone who was licensed (SWRCB 2006). Compliance with the provisions of this permit would adequately prevent against water quality degradation.

Furthermore, other pesticides, including herbicides used for vegetation maintenance, would be used as part of proposed maintenance activities. These pesticides could be accidentally released into channels and canals through spills and could be washed into the stream during storm events, impacting stream water quality. Pesticides also could cause impacts on groundwater quality if they were dissolved in water and filtered through the soil into the groundwater table. However, the majority of harmful constituents sorb onto soil particles would be broken down by organic matter into non-toxic forms and would not reach the groundwater table.

Only pesticides approved by USEPA and registered for use by the California Department of Pesticide Regulation would be used for proposed maintenance activities.

Minor Maintenance Activities

Minor maintenance activities may require the use of herbicides as part of efforts to control weeds during on-going maintenance of landscaping sites. Potential effects of these herbicide applications would be similar to those described above for vegetation management.

Management of Animal Conflicts

Animal conflicts management could include the use of bait traps, which would utilize rodenticides. These activities could potentially affect the water quality of the local creeks and channels if they were transported from the trap and application areas.

Sediment Removal/Bank Stabilization Activities

These activities would not involve the use of pesticides and would have no effect on channel or canal water quality.

Applicable Best Management Practices

The following BMPs would be implemented as part of the SMP Update to minimize the potential for water quality degradation. Descriptions of each BMP are provided in Chapter 2, *Project Description*.

BMP GEN-2: Instream Herbicide Application Work Window
BMP GEN-24: On-Site Hazardous Materials Management
BMP GEN-26: Spill Prevention and Response
BMP ANI-1: Avoid Redistribution of Rodenticides

Conclusion

By implementing these BMPs, impacts related to water quality degradation caused by the use of pesticides in Proposed Project activities would be less than significant and would not require mitigation.

Mitigation Measures: No mitigation is required.

Impact WQ-5: Water Quality Degradation Resulting in Violation of Water Quality Standards or Waste Discharge Requirements Caused by the Disturbance of Existing Contamination (Significance Criterion A; Less than Significant)

SCVWD-maintained channels (and to a lesser extent, canals) would receive and convey stormwater runoff from surrounding developed areas. Contaminants from stormwater runoff, such as metals and petroleum residues, could adhere to fine sediments that settled and accumulated in the stream or canal bottom. Large quantities of organic matter mingled with fine sediments would encourage sorption of urban contaminants. Sediments near storm drain outfalls may contain high concentrations of urban contaminants. The transport

of contaminated soils downstream could result in a violation of water quality standards or waste discharge requirements. Where required, the applicable Water Quality Monitoring and/or Sediment Characterization plans will be implemented as specified by the RWQCB permits.

Sediment Removal

As discussed in Section 3.6.3, Environmental Setting (Section 3.6, *Hazards and Hazardous Materials*), numerous sites in Santa Clara County are contaminated with hazardous materials. In addition, contaminants have been identified and measured in the Project Area, (as identified in Table 3.13-3, which summarizes sediment constituent threshold exceedances in surface water bodies for sediments removed as part of the SMP in 2009 and 2010). The Guadalupe River watershed has experienced mercury contamination, which has been addressed through a TMDL for mercury that was approved in 2010.

The proposed sediment removal activities could potentially adversely affect water quality, if contaminated sediments were transported downstream, or improve water quality by removing contaminated sediments from the watersheds. Disturbances of contaminated sediments as part of the sediment removal activities could potentially affect the water quality standards or waste discharge requirements if these sediments were transported downstream. However, in general, the removal of contaminated sediments in the Project Area, including mercury-contaminated sediment in the Guadalupe River watershed, would reduce the amount of contamination in water bodies, meeting the applicable TMDLs.

Other Maintenance Activities

Disturbances of contaminated soils could occur as part of the vegetation management's discing activities, minor maintenance grading, minor levee alterations to manage animal conflicts, or as part of bank stabilization activities. Potential effects of contaminated soil disturbances would be similar to those described above for sediment removal activities. The removal of trash and debris, a minor maintenance activity of the Proposed Project, would benefit water quality by removing potentially contaminating waste from stream channels. Because routine canal maintenance activities would include all general work activities, effects would be the same as described above for other routine maintenance work.

Applicable Best Management Practices

The following BMPs would be implemented as part of the SMP Update to minimize the potential for water quality degradation. Descriptions of each BMP are provided in Chapter 2, *Project Description*.

BMP GEN-3: Avoid Exposing Soils with High Mercury Levels
BMP GEN-4: Minimize the Area of Disturbance
BMP GEN-27: Existing Hazardous Sites

Conclusion

By implementing these BMPs, the District would minimize the disturbance of existing contaminated soils and encourage proper handling of any contaminated soils encountered during maintenance activities. Impacts related to water quality degradation caused by the disturbance of existing contamination would be less than significant and would not require mitigation.

Mitigation Measures: No mitigation is required.

Impact WQ-6: Compliance with CWA Section 303(d) Total Maximum Daily Loads (Significance Criterion A; Less than Significant)

Table 3.13-2 lists impaired water bodies and the corresponding TMDLs for each one as identified by the RWQCBs and USEPA. Only TMDLs approved by USEPA are enforceable. No additional contributions of 303(d) listed constituents are allowed until a TMDL has been approved. Currently, TMDLs established to control and reduce mercury and PCB contamination within the Project Area would apply to the SMP Update. As part of the TMDL enforcement procedure, the RWQCBs could add TMDL conditions to municipal permits and WDRs. Where required, the applicable Water Quality Monitoring and/or Sediment Characterization plans will be implemented as specified by the RWQCB permits.

Sediment Removal

Proposed sediment removal activities would involve ground disturbance and could potentially mobilize contaminated sediments, such as mercury and PCB-contaminated sediment, which would already be present within stream channels. However, these activities would not contribute to new contamination in stream channels. In fact, over the period of implementation, the Proposed Project would remove significant quantities of sediment contaminated with mercury and PCBs from the system. This action would align with TMDL plans established by USEPA to alleviate water and sediment contamination in the Project Area.

Furthermore, SCVWD would comply with its municipal permit requirements; the Proposed Project would be reviewed and approved by the RWQCBs before being implemented by SCVWD. Also, SCVWD would implement a water and sediment quality monitoring program as part of the SMP Update and comply with permits issued by the RWQCBs. The water quality and sediment characterization monitoring programs would additionally support maintenance activities that would minimally disturb contamination and encourage proper handling of contaminated sediment to prevent mobilization and distribution of that contaminated sediment during and after maintenance activities.

Other Maintenance Activities

Other proposed maintenance activities (i.e., vegetation management, management of animal conflicts, bank stabilization, minor maintenance, and canal maintenance) also would potentially involve ground disturbance or sediment removal. Effects of sediment removal or ground disturbances would be similar to those described above for the proposed sediment

removal activities. In addition, as described above, SCVWD would comply with its permits and perform sediment and water quality monitoring programs.

Applicable Best Management Practices

The following BMPs would be implemented as part of the SMP Update to support compliance with CWA Section 303(d) TMDLs. Descriptions of each BMP are provided in Chapter 2, *Project Description*.

BMP GEN-3: Avoid Exposing Soils with High Mercury Levels
BMP GEN-4: Minimize the Area of Disturbance
BMP GEN-20: Erosion and Sediment Control Measures
BMP SED-1: Groundwater Management
BMP SED-2: Prevent Scour Downstream of Sediment Removal

Conclusion

The Proposed Project would be designed to minimize ground disturbance and the potential disruption of contaminated sediments. In addition, the Proposed Project would adhere to its permit requirements and would implement water quality and sediment monitoring programs. This impact would be less than significant and no mitigation would be required.

Mitigation Measures: No mitigation is required.

Impact WQ-7: Water Quality Degradation Resulting in Violation of Water Quality Standards or Waste Discharge Requirements Caused by Sediment Handling and Disposal (Significance Criterion A; Less than Significant)

Sediment removed from stream channels during stream maintenance could contain contaminants. Improper handling and disposal of contaminated sediment could impact the beneficial uses of a stream. Also, sediment transport and disposal activities could result in sediment spills, which could impact water quality if sediments were spilled into the storm drain network or directly into water bodies. Where required, the applicable Water Quality Monitoring and/or Sediment Characterization plans will be implemented as specified by the RWQCB permits. The potential of the Proposed Project's activities to involve sediment handling and disposal is further described below.

Sediment Removal/Bank Stabilization

Sediment removal and bank stabilization activities would involve grading activities and sediment handling and disposal. As described above, these activities could potentially degrade channel water quality if the sediments were improperly handled, disposed, or accidentally spilled. The RWQCB with jurisdiction over each stream would review and approve sediment test results before the onset of sediment removal activities on any stream. The RWQCB also would approve sediment disposal sites. However, the potential would exist for the handling of these sediments to affect the water quality of local water bodies.

Vegetation Management

Vegetation management activities may involve some discing of sediments but would not require the disposal or testing of sediments. The potential effects of sediment handling would be similar to those described above for sediment removal/bank stabilization.

Other Maintenance Activities

Minor maintenance, management of animal conflicts, and canal maintenance activities could involve grading, levee slope alterations, or sediment removal activities that would involve the handling and/or disposal of sediments. The potential effects of sediment handling or disposal activities would be similar to those described above for sediment removal/bank stabilization, although they would not require testing because of the limited amount of sediment.

Applicable Best Management Practices

The following BMPs would be implemented as part of the SMP Update to minimize the potential for water quality degradation. Descriptions of each BMP are provided in Chapter 2, *Project Description*.

BMP GEN-4: Minimize the Area of Disturbance
BMP GEN-21: Staging and Stockpiling of Materials
BMP GEN-22: Sediment Transport
BMP GEN-29: Dust Management
BMP GEN-31: Vehicle Cleaning

Conclusion

Sediment handling and disposal during Proposed Project activities would not degrade water quality so that violations of water quality standards or waste discharge requirements would occur. Potential impacts related to the Proposed Project's activities would be less than significant and would not require mitigation.

Mitigation Measures: No mitigation is required.

Impact WQ-8: Create or Contribute Runoff Water that Would Provide Substantial Additional Sources of Polluted Runoff (Significance Criterion B; Beneficial)

The Proposed Project would not involve the construction of large areas of impermeable surfaces that would contribute substantial additional sources of polluted runoff. In addition, implementing the Proposed Project would not require expansion of existing channels within the Project Area and would not alter the quantity of stormwater runoff conveyed from adjacent lands and received in stream channels. However, the Proposed Project would improve the quality of stormwater runoff received in streams and conveyed downstream.

Vegetation Management

Revegetation management activities would improve the functioning of instream and riparian vegetation, which in turn would promote filtration of pollutants from stormwater runoff and improve instream habitat.

Sediment Removal/Bank Stabilization/Minor Maintenance/Canal Maintenance

Proposed Project activities, including sediment removal, also could improve water quality in a channel by removing existing contamination from the stream (both trash and contaminated sediments). Bank stabilization activities would improve stormwater quality by reducing the potential for sediment transport from unstable banks. Minor maintenance activities could involve trash or sediment removal, which would result in similar potential effects as those described for sediment removal. Because routine canal maintenance activities would include all general work activities, effects would be the same as described above for other routine maintenance work.

Management of Animal Conflicts

Animal conflict management activities generally would not involve any activities that would affect stormwater quality. However, rodenticides used in SCVWD bait traps could potentially affect stormwater quality, if spilled and released into a waterway. This is anticipated to be an extremely unlikely event.

Applicable Best Management Practices

The following BMP would be implemented as part of the SMP Update to minimize the potential for creating or contributing runoff water that would provide substantial additional sources of polluted runoff. A description of this BMP is provided in Chapter 2, *Project Description*.

BMP ANI-1: Avoid Redistribution of Rodenticides

Conclusion

By implementing BMP ANI-1, the Proposed Project would have an overall beneficial impact on the stormwater runoff quality received in channels and would not require mitigation.

Mitigation Measures: No mitigation is required.

Impact WQ-9: Alterations to the Quality of Groundwater (Significance Criterion A; Beneficial)

The Proposed Project would have the potential to affect the quality of groundwater as discussed below.

Bank Stabilization/Sediment Removal/Vegetation Management

Proposed maintenance activities would include stabilizing failing stream banks and supporting the growth of riparian vegetation along channel banks, which would assist in reducing fine sediment inputs to channels. Annual sediment removal activities and reshaping of a channel in some locations to prevent sediment deposition in the channel bed would improve groundwater percolation and filtration functioning. Use of pesticides and herbicides would not occur before rainy conditions that could cause them to percolate to groundwater.

Minor Maintenance

Minor maintenance activities could include the removal of sediments, which would result in beneficial effects on groundwater quality, as described above.

Management of Animal Conflicts

These activities would not alter the groundwater quality. In particular, use of rodenticides would not occur before rainy conditions that could cause them to percolate to groundwater.

Canal Maintenance

Because routine canal maintenance activities would include all general work activities, effects would be the same as described above for other routine maintenance work.

Applicable Best Management Practices

No BMPs would be applicable for this impact.

Conclusion

The Proposed Project would have beneficial effects on the quality of groundwater and would not require mitigation.

Mitigation Measures: No mitigation is required.

Chapter 4
OTHER STATUTORY CONSIDERATIONS

4.1 Introduction

This chapter describes the irreversible impacts, significant and unavoidable impacts, growth-inducing impacts, and cumulative impacts of the Proposed Project as required by the State CEQA Guidelines.

4.2 Irreversible Impacts

State CEQA Guidelines Section 15126.2(c) requires that an environmental impact report (EIR) must identify any irreversible impacts, also referred to as irreversible environmental changes that may be caused by a proposed project, including current or future commitments to using non-renewable resources, secondary, or growth-inducing impacts that commit future generations to similar uses. Section 15126 of the State CEQA Guidelines states that significant, irreversible environmental changes associated with a proposed project may include:

- uses of non-renewable resources during the initial and continued phases of the project which may be irreversible because a large commitment of such resources makes removal or nonuse thereafter unlikely;
- primary impacts and, particularly, secondary impacts (such as highway improvement that provides access to a previously inaccessible area) that commit future generations to similar uses; and
- irreversible damage, which may result from environmental accidents associated with the project.

An irretrievable commitment of nonrenewable resources would occur as a result of the Proposed Project. Implementation of the Proposed Project would involve maintenance activities, requiring the temporary use of heavy equipment, which would require the use of fossil fuels, and permanent use of raw materials, including nonrenewable resources. Future use of such resources would not be compulsory if alternative means of flood protection were implemented to alleviate the need for the SMP Update. The practices under the Proposed Project should reduce the need for maintenance over time. In addition, the SMP Update is not anticipated to have secondary impacts that would commit future generations to similar uses or result in irreversible damage.

4.3 Significant and Unavoidable Impacts

Section 15126.2(b) further requires an EIR to describe any significant impacts that cannot be mitigated to a level of insignificance. All of the impacts associated with the Proposed Project would be maintained/reduced to a less-than-significant level by implementation of identified BMPs (described in Chapter 2, *Project Description*) and mitigation measures, with the exception of the impacts discussed below.

The following impacts have been identified as significant and unavoidable. Please refer to the impact analysis sections in Chapter 3, *Environmental Setting and Impact Analysis*, and cumulative impact analysis in Chapter 5, *Alternatives Analysis* for a full description of impacts.

- **Impact AES-3:** Temporary Alteration of Visual Character or Quality from Maintenance Activities
- **Impact AES-4:** Permanent Alteration of Visual Character or Quality from Maintenance Activities
- **Impact AIR-1:** Temporary Increase in ROG, NOx, PM_{10}, and $PM_{2.5}$ Emissions during Maintenance Activities
- **Impact Bio-45:** Habitat Fragmentation
- **Impact GCC-1**: Temporary Increase in GHGs during Maintenance Activities
- **Impact NZ-1:** Temporary Exposure of the Public to Noise Levels in Excess of City or County Standards
- **Impact NZ-3:** Temporary Substantial Increase in Noise above Ambient Levels
- **Cumulative Impact AIR-1**: Emissions of ROG, NOx, PM_{10}, and $PM_{2.5}$
- **Cumulative Impact AIR-2**: Emissions of Greenhouse Gases
- **Cumulative Impact Bio-2:** Habitat Fragmentation

4.4 Growth Inducing Impacts

Section 15126.2(d) of the State CEQA Guidelines requires an EIR to include a detailed statement of a proposed project's anticipated growth-inducing impacts. The analysis of growth-inducing impacts must discuss the ways in which a proposed project could foster economic or population growth or the construction of additional housing in the project area. The analysis also must address project-related actions that, either individually or cumulatively, would remove existing obstacles to population growth. A proposed project is considered growth inducing if it induces growth directly (through the construction of new housing or increasing population) or indirectly (increasing employment opportunities or eliminating existing constraints on development). Under CEQA, growth is not assumed to be either beneficial or detrimental.

The Proposed Project would not involve new development that could directly induce population growth, nor would it involve the extension of infrastructure that could indirectly induce population growth. The Proposed Project would not involve construction of new housing or create a demand for additional housing, such as through commercial development. Minimal additional staff are expected to be required to carry out the proposed maintenance activities under the SMP Update. Furthermore, the Proposed Project on its own would not displace any existing housing units or persons. The proposed maintenance activities would be limited to SCVWD-owned lands, easements, or parcels approved for work activities by the Board of Directors. Furthermore, if SCVWD were to stop maintaining SMP Update channels, this could result in increased flood risk, impeding potential future development in areas that currently are undeveloped and subject to such flooding. However, under baseline conditions, no known flooding issues are impeding development that would be resolved by maintenance activities conducted under the Proposed Project. As such, the SMP Update is not anticipated to remove any obstacles to growth.

4.5 Cumulative Impacts Analysis

A cumulative impact refers to the combined effect of "two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts" (State CEQA Guidelines Section 15355). As defined by the State of California, cumulative impacts reflect "the change in the environment which results from the incremental impact of the project when added to other closely related past, present, and reasonably foreseeable probable future projects. Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time." (State CEQA Guidelines Section 15355[b])

Under CEQA, an EIR must discuss the cumulative impacts of a proposed project when the project's incremental contribution to the group effect is "cumulatively considerable." An EIR does not need to discuss cumulative impacts that do not result in part from the project evaluated in the EIR. The State CEQA Guidelines (Section 15130[a]) require that an EIR address the cumulative impacts of a proposed project when:

- the cumulative impacts are expected to be significant; and
- the project's contribution to the cumulative impact is expected to be cumulatively considerable, or significant in the context of the overall (cumulative) level of effect.

To meet the adequacy standard established by Section 15130 of the State CEQA Guidelines, an analysis of cumulative impacts must contain the following elements:

A. an analysis of related future projects or planned development that would affect resources in the project area, similar to those affected by the proposed project;

B. a summary of the environmental effects expected to result from those projects, with specific reference to additional information, stating where that information is available;

C. a reasonable analysis of the combined (cumulative) impacts of the relevant projects; and

D. an evaluation of a proposed project's potential to contribute to the significant cumulative impacts identified, and a discussion of feasible options for mitigating or avoiding any contributions assessed as cumulatively considerable.

The discussion of cumulative impacts is not required to provide as much detail as the discussion of the effects attributable to the project alone. Rather, the level of detail needs to be guided by what is practical and reasonable. In addition, Section 15130(e) of the State CEQA Guidelines directs that if a cumulative impact is adequately addressed in a prior EIR for a general plan, and the proposed project is consistent with that general plan, the project EIR need not further analyze that cumulative impact.

Lead agencies may use a "list" approach to identify related projects, or may base the identification of cumulative impacts on a summary of projections in an adopted general plan or related planning document (State CEQA Guidelines Section 15130[b]), the "projection" approach.

4.5.1 Methods Used in this Analysis

The cumulative impact analysis utilizes the projection approach. Table 4-1 provides an overview of the planning documents used in the analysis. Santa Clara County was the geographic area considered for the cumulative impact analysis, except where an alternative geographic area was appropriate (e.g., global climate change was considered on a regional and global scale). Additional information on each planning document is provided in the regulatory setting sections in Chapter 3, *Environmental Setting and Impact Analysis*. Table 4-2 shows population and housing growth projections in the County.

SCVWD's 5-year capital improvement program (CIP) for fiscal years 2011–2015 includes numerous projects that would occur throughout Santa Clara County that could affect resources similar to those affected by the Proposed Project. Table 4-3 lists those 5-year CIP projects that could affect resources similar to the Proposed Project and project activities that could potentially affect resources similar to the Proposed Project. Other operations and maintenance projects also would be conducted by the District, such as canal operations, which could have similar effects.

The cumulative impact analysis in the following section provides an assessment as to whether the projections described above, along with the projects listed in SCVWD's CIP and other operations and maintenance projects, would result in significant cumulative impacts, and whether the SMP Update would make a considerable contribution to those significant cumulative impacts. Some of the projects listed in Table 4-3 have been completed. SCVWD is preparing a 2012–2016 CIP to update the current CIP by noting completed projects and projects added. Note that the State CEQA Guidelines state that lead agencies "should define the geographic scope of the area affected by the cumulative effect" (Section 15130[b][3]). The geographic scope of the analysis in this document varies depending upon the particular resource topic. For instance, greenhouse gas emissions are considered at a global scale; air quality emissions are considered at the scale of the air basin; the scale of analysis for noise would be limited to those areas that could potentially be affected by Proposed Project-related noise.

Internal Draft—Not for Public Review

Table 4-1. Planning Documents Considered for Cumulative Impact Analysis

Document	Summary
Santa Clara County General Plan 1995–2010 (1994)	The 1995-2010 General Plan is the most current adopted general plan. The broad purpose of the Santa Clara County General Plan is to express policies which will guide decisions on future growth, development, and conservation of resources through 2010. It specifically addresses the unincorporated areas of the County. The vision for the General Plan consists of the following four basic themes that encompass and articulate the fundamental policy directions of the Plan. Within these four themes the plan established major planning goals, as identified below. *Social and Economic Well-Being* ✦ Equality of Opportunity and Respect for Diversity ✦ A Healthy, Diverse Economy and Adequate Employment Opportunities ✦ Educational Excellence ✦ Community Participation in Decision Making ✦ Sense of Belonging and Contribution to Community ✦ Well-Functioning Families ✦ Personal Safety and Security ✦ Support for Those with Special Needs ✦ Adequate, Accessible Health Care and Social Services *Managed, Balanced Growth* ✦ Coordinate Countywide Planning and Cooperative Plan Implementation ✦ Balanced Development ✦ Planned, Orderly Urban Expansion ✦ Urban Development Appropriately Located ✦ Rural Development Appropriate to Rural Areas ✦ Compact, Transportation-Efficient Urban Development *Livable Communities* ✦ Adequate and Affordable Housing ✦ Convenient Transportation ✦ Accessible Parks and Public Open Space ✦ Cultural and Recreational Amenities ✦ Efficient and Adequate Urban Services ✦ Attractive Communities Enhanced by their Natural Surroundings ✦ Safety from Natural and Other Hazards

Table 4-1. Planning Documents Considered for Cumulative Impact Analysis

Document	Summary
	Responsible Resource Conservation ✦ A Healthy, Well-Functioning Natural Environment ✦ Healthful Air Quality ✦ Water Supply Resources Conserved and Protected ✦ Special Water Environmental Protected and Restored ✦ Heritage Resources Protected ✦ Productive Agriculture ✦ Mineral Resources Conserved and Responsibility Extracted ✦ Energy Resources Conserved ✦ Solid Waste Effectively Managed
City of Campbell General Plan (2001)	The purpose of a city's General Plan is to guide decisions regarding physical growth and development, provision of public services and facilities, and conservation and enhancement of natural resources. Therefore, Campbell's General Plan: ✦ Outlines a vision of long-range physical and economic development and resource conservation that reflects the aspirations of the community; ✦ Provides strategies that will allow this vision to be accomplished; ✦ Establishes a foundation upon which the City Council and Commissions can base policy decisions and a basis for judging whether specific development proposals and public projects are in harmony with community desires; ✦ Allows City departments, other public agencies, and private developers to design projects that will enhance the character of the community, preserve and enhance critical environmental resources, and minimize hazards; ✦ Provides the basis for establishing and setting priorities for detailed plans and implementing programs, such as the Zoning Ordinance, specific plans, and the Capital Improvement Program; and ✦ Addresses the issue of land availability to meet the City's economic development objectives, the need for housing in the community, and State law requirements for Campbell to accept its "fair share" of the regional housing needs.
City of Cupertino General Plan 2000–2020 (2005)	The Cupertino General Plan is a roadmap to the future that encompasses the hopes, aspirations, values and dreams of the community. It provides a vision of the City's future by integrating the aspirations of residents, businesses and officials into a comprehensive strategy for guiding future development and managing change. The General Plan describes the long-term goals for the City's future and guides daily decision-making. The time frame of the Plan is 2000-2020. The Plan contains the City's official policies on land use and community design, transportation, housing, environmental resources and public health and safety. It provides guidance about growth, housing, transportation, neighborhood improvement and municipal service delivery.
City of Gilroy 2002–2020 General Plan (2002)	The Gilroy General Plan is a statement of community values and priorities. The General plan does the following: ✦ Considers the issues and trends affecting the City today; ✦ Describes the type of community we want to be in the future; ✦ Sets forth goals, policies and implementing actions across a wide range of issue areas to help us achieve our aims; ✦ Describes how the General Plan should be managed over time;

Table 4-1. Planning Documents Considered for Cumulative Impact Analysis

Document	Summary
	✦ Identifies near-term priorities for putting the General Plan into action; and ✦ Articulates our vision of the future and how we intend to realize it.
City of Los Altos General Plan (2002)	The Los Altos General Plan serves as a blueprint for future growth and development. As such, the plan contains policies and programs designed to provide decision makers with a solid foundation for land use and development decisions. The Los Altos General Plan represents the values and outlines the vision of the community. The Plan organizes the desires of Los Altos residents with respect to the physical, social, economic, and environmental character of the City. It embodies what the City is now and what it hopes to be in 2020.
Town of Los Altos Hills General Plan Update 2007 (2007)	The Los Altos Hills General Plan focuses on the major aspects of community development and change. The General Plan is "comprehensive" in that it is the one document that sets forth ALL of the major physical parameters of development in the Town and assures that all aspects are consistent with each other. Finally, the General Plan deals primarily with the physical development of the community and land use issues. This does not mean, however, that non-physical aspects of the community are ignored. General Plan goals and policies sometimes address non-physical aspects of the community, such as social, economic and public interest concerns. The General Plan is the basis for a wide range of community actions. These include the establishment of community development regulations such as zoning, site development, and subdivision ordinances as well as public safety programs.
City of Milpitas General Plan (2002)	The Milpitas General Plan describes the City's ideas for its future and the ways in which it intends to transform these ideas into reality. The General Plan incorporates the Midtown Specific Plan and Transit Area Plan which establish the nature, character and location of activities and development; guide the orderly growth of the Midtown area and southern area near transit; define the nature of development and the physical framework of those areas; and provide a basis for future implementing actions to improve and beautify the areas.
Monte Sereno General Plan (2008)	The General Plan is the principal policy document to guide future conservation, enhancement and development in Monte Sereno. It represents the basic policy direction of the City Council on community values, ideals and aspirations to govern a shared environment through 2025. The General Plan addresses all aspects of development including land use, transportation, housing, public facilities and infrastructure and open space. The following Guiding Principles serve as the foundation to this General Plan: ✦ Community Character ✦ Environmental Sustainability ✦ Enhanced Mobility ✦ Quality Public Services ✦ Community Safety
Morgan Hill General Plan (2001)	The General Plan envisions Morgan Hill keeping its small-town character while offering new opportunities for businesses and amenities for residents. Agriculture will continue at the outskirts, and new housing for a range of incomes will be accommodated in a variety of locations. Urban land uses will be encouraged around the downtown, and incentives would foster infill development instead of sprawl.

Table 4-1. Planning Documents Considered for Cumulative Impact Analysis

Document	Summary
City of Mountain View 1992 General Plan (1992)	The General Plan looks to the future, including projections for accommodating the growth of both housing and business, based on the most current available information. It is the City's framework for future decisions, especially for community development and preservation and environmental conservation until 2005. This framework is built on the Plan's Goals, Policies, and Actions, which provide a carefully balanced, internally consistent set of statements to guide the future polices of the community. Two basic premises of the General Plan are that growth can be directed to achieve beneficial ends, and the magnitude and location of growth is of direct concern to the residents, businesses, and taxpayers of the community. Three basic themes are woven throughout the 1992 General Plan: ✦ Celebration of the community as it is now; ✦ Diversity of opportunities, past and present; and ✦ The evolution of the community, building on accomplishments while consciously preparing for the future.
City of Palo Alto Comprehensive Plan (2007)	The Palo Alto Comprehensive Plan contains the City's official policies on land use and community design, transportation, housing, natural environment, business and economics, and community services. Its policies apply to both public and private properties. Its focus is on the physical form of the City. The Plan has seven major themes, as follows: ✦ Building community and neighborhoods; ✦ Maintaining and enhancing community character; ✦ Reducing reliance on the automobile; ✦ Meeting housing supply challenges; ✦ Protecting and repairing natural features; ✦ Meeting residential and commercial needs; and ✦ Providing responsive governance and regional leadership.
City of San Jose 2020 General Plan (2010)	The Major Strategies of this General Plan establish the basic framework for planning in San José. The strategies also express the philosophy that the City should take a leadership role in the planning process, while encouraging community and private secto r participation. Major strategies include: ✦ Economic Development ✦ Growth Management ✦ Downtown Revitalization ✦ Urban Conservation/Preservation ✦ Greenline/Urban Growth Boundary ✦ Housing ✦ Sustainable City

Table 4-1. Planning Documents Considered for Cumulative Impact Analysis

Document	Summary
City of Santa Clara 2010–2035 General Plan (2010)	This General Plan's vision is long-range, supported by a spectrum of strategies and policies to deal with changing priorities and development pressures that the City will face through the coming years. Because this Plan looks forward 25 years into our future, it recognizes that changing circumstances may alter collective choices as we move toward that far-time horizon. This General Plan has been designed as a "Progressive Plan" that breaks down the 25-year horizon into three planning phases that are more manageable and responsive to change and future needs. In order to provide a structure for decision-making for development in the City, the General Plan outlines Major Strategies that provide the foundation for defined goals and policies. Together, these guide decisions that affect land use, neighborhood conservation, transportation, parks, and other aspects of the City's physical form. The major strategies are as follows: ✦ Enhance the City's High Quality of Life ✦ Preserve and Cultivate Neighborhoods ✦ Promote Sustainability ✦ Enhance City Identity ✦ Support Focus Areas and Community Vitality ✦ Maintain the City's Fiscal Health and Quality Services ✦ Maximize Health and Safety Benefits
City of Saratoga General Plan (2007)	Several elements of the General Plan have been updated since 1983. The General Plan represents the wishes and desires of the citizens of Saratoga and will be the basis of future decisions within the City for the next five to ten years. The document provides citizens, public bodies and staff the needed direction to make decisions about the future development and character of the city. The format of the General Plan was designed in such a manner to allow the citizens to ascertain the guiding goals and polices, without having to comb through the entire document.
City of Sunnyvale General Plan (2009)	This General Plan's vision is long-range, supported by a spectrum of strategies and policies to deal with changing priorities and development pressures that the City will face through the coming years. Because this Plan looks forward 25 years into the future, it recognizes that changing circumstances may alter collective choices as we move toward that far-time horizon. It is the vision and goals of the General Plan which give meaning and direction to all of the major decisions made by the City. It provides the context within which the City executive management team regularly undertakes short-range strategic planning, which translates the long-range, somewhat abstract goals of the General Plan into action strategies which address the current issues facing the City. These action strategies, in turn, guide the rational allocation of resources through the operating budget, projects budget and study issue process to those actions and services which can most cost-effectively meet the needs of the community.

Source: Data compiled by Horizon Water and Environment in 2011

Table 4-2. Projected Santa Clara County Population and Housing Growth, 2010–2030

Jurisdiction	Population			Projected Annual Population Growth (%)	Housing			Projected Annual Housing Growth (%)
	2010	2020	2030		2010	2020	2030	
Campbell	40,500	44,100	45,900	0.7	16,890	18,360	19,350	0.7
Cupertino	55,200	56,300	57,100	0.2	19,830	20,360	21,100	0.3
Gilroy	49,800	58,700	66,000	1.6	14,330	16,710	18,870	1.6
Los Altos	28,400	29,400	30,200	0.3	10,670	11,030	11,420	0.4
Los Altos Hills	8,800	8,800	9,000	0.1	3,070	3,120	3,180	0.2
Los Gatos	29,600	30,000	30,100	0.1	12,430	12,600	12,900	0.2
Milpitas	69,000	82,300	98,100	2.1	19,030	23,090	27,990	2.4
Monte Sereno	3,400	3,600	3,600	0.3	1,220	1,230	1,250	0.1
Morgan Hill	38,200	42,200	45,800	1.0	12,400	13,820	15,180	1.1
Mountain View	72,100	80,200	87,300	1.1	32,110	36,090	40,120	1.2
Palo Alto	61,600	70,400	80,400	1.5	26,700	29,910	34,890	1.5
San Jose	981,000	1,137,700	1,299,700	1.6	305,140	356,470	409,640	1.7
Santa Clara	114,700	128,800	148,200	1.5	43,410	48,940	56,620	1.5
Saratoga	31,400	31,400	31,400	0.0	11,000	11,030	11,080	0.0
Sunnyvale	135,200	147,300	157,900	0.8	54,170	59,170	64,310	0.9
Unincorporated Santa Clara County	103,100	111,900	120,100	0.8	31,600	34,600	37,190	0.9
Santa Clara County Total	***1,822,000***	***2,063,100***	***2,310,800***	***1.3***	***614,000***	***696,530***	***785,090***	***1.4***

Source: ABAG 2009

Table 4-3. SCVWD 5-Year Capital Improvement Program and Project Activities that could potentially affect resources similar to the Proposed Project in fiscal years 2011–2015

CIP Project	Activities that Could Potentially Affect Resources Similar to the Proposed Project
Water Supply Capital Improvements	
Storage Facilities	
Almaden Dam Outlet Works Improvements	Modify and/or construct new intake structure and fix energy dissipation structure. Work within waters of U.S.
Calero/Fellows Dike Improvement	Aims to rescind the Department of Water Resources, Division of Safety of Dams restriction, which limits storage capacity. Project could increase storage capacity.
Dam Safety Program Seismic Stability Evaluation	Funding for construction of seismic stability improvements at one dam.
San Tomas Well Field	Preserve and improve groundwater extraction capacity.
Small Capital Improvements, San Felipe Reach 1-3	Infrastructure development including tunnels, large diameter pipelines and valve structures, pumps and associated equipment, as well as a large above-ground storage tank.
Transmission Facilities	
Alamitos Diversion Dam Improvements	Construct improvements at dam on the Guadalupe River.
Almaden–Calero Canal Rehabilitation	Improvements along canal.
Cathodic Protection of SCVWD-Owned Pipelines	General construction activities typical for pipeline improvements.
Cathodic Protection of U.S. Bureau of Reclamation-Owned Pipelines	General construction activities typical for pipeline improvements.
Coyote Diversion Dam Improvements	Percolation dam improvements.
East Pipeline Rehabilitation	Major pipeline repairs. Pipeline crosses several creeks and could include repairs to creek crossings.
Water Infrastructure Reliability Plan, Phase 2 (IRP2) Additional Line Valves	Installation of large, new line valves on existing pipelines.
IRP2 Well Fields	Construction of approximately 20 new wells to provide up to 80 million gallons per day of emergency supply.
Kirk Diversion Dam & Fish Screen Improvements	Dam improvements including to the flashboard system, as well as reducing entrainment, and maintenance.
Main & Madrone Avenue Pipelines Restoration	Pipeline restoration to utilize a reliable water source.
Penitencia Fish Facilities Modifications	Prevent exotic species introduction and develop water supplies and exercise water rights
Santa Clara Conduit Rehab, S Valve 1 to Coyote Pumping Plant	Construction of improvements to 11 miles of the Santa Clara Conduit.
Stevens Creek & Vasona Raw Water Distribution	Raw water conveyance system improvements.
Treatment Facilities	
IRP2 Seismic Study and Retrofit of Water Treatment Plant Operations Building	Construction of buildings.
Penitencia Water Treatment Plant (PWTP) Maintenance Building	Construction of buildings.
PWTP Washwater Clarification Facility	Construction of new washwater facility to improve treated water quality.

Table 4-3. SCVWD 5-Year Capital Improvement Program and Project Activities that could potentially affect resources similar to the Proposed Project in fiscal years 2011–2015

CIP Project	Activities that Could Potentially Affect Resources Similar to the Proposed Project
RWTP Facility Renewal Program (FRP) Residuals Management	Retrofitting of washwater recovery basins.
RWTP FRP Site Improvement	Roadway widening.
RWTP Reliability Improvement	Significant improvements to treatment plant.
RWTP Standby Power System Upgrade	Construction of permanent power facility.
Small Capital Improvements, Water Treatment	Small projects resulting in new disturbances and repair of water control facilities.
Recycled Water Facilities	
South Bay Advanced Recycled Water Treatment Facility	Construction of recycled water plant.
Recycled Water Master Plan	Construction of pipeline and 3 million gallons reservoir.
Flood Protection Capital Improvement Projects	
Lower Peninsula Watershed	
Adobe Creek, El Camino Real to Rhus Ridge (Reach 1-13)	Stream improvements for flood and erosion protection, sediment transport and fish passage. Work within streams.
Permanente Creek, San Francisco Bay to Foothill Expressway	Flood protection, reduce erosion and sedimentation, environmental restoration, and recreation enhancements. Work within streams.
San Francisquito Creek, San Francisco Bay through Searsville Dam	Flood protection, reduce bank erosion and sedimentation, avoid impacts to fish and wildlife habitat, and restore riparian corridor. Work within streams.
West Valley Watershed	
Calabazas Creek, Bollinger Bridge	Flood protection; restore vegetation and habitat, some construction for infrastructure improvements. Work within streams.
Calabazas Creek, Miller Avenue to Wardell Road	Flood protection; and reduce erosion and sedimentation. Work within streams.
San Tomas Creek, Quito Road Bridges Replacement	Construct bridge replacements.
Sunnyvale East and West Channels	Flood protection, recreation enhancements, reduce erosion and sedimentation, and protect fish and wildlife. Work within streams.
Guadalupe Watershed	
Guadalupe River-Downtown, Interstate 880 to Interstate 280	Flood protection, improve water quality, and enhance fish and wildlife habitat. Work within streams.
Guadalupe River-Upper, Interstate 280 to Blossom Hill Road	Flood protection, increase riparian forest acreage, improve wildlife habitat, access to upstream spawning and rearing habitat, and reduce bank erosion and sedimentation. Work within streams.
Coyote Watershed	
Berryessa Creek, Calaveras Boulevard to Old Piedmont Road	Flood protection, reduce sedimentation, and improve stream habitat. Work within streams.
Berryessa Creek, Lower Penitencia Creek to Calaveras Boulevard	Flood protection and improve structural integrity of levees. Work within streams.
Coyote Creek, Montague Expressway to Interstate 280	Flood protection and mitigation of project impacts to stream habitat and fisheries. Work within streams.
Lake Cunningham Improvements	Flood protection. Work within streams.
Lower Penitencia Creek, Berryessa to Coyote Creeks	Flood protection. Work within streams.

Table 4-3. SCVWD 5-Year Capital Improvement Program and Project Activities that could potentially affect resources similar to the Proposed Project in fiscal years 2011–2015

CIP Project	Activities that Could Potentially Affect Resources Similar to the Proposed Project
Lower Silver Creek, I-680 to Cunningham (Reach 4-6)	Flood protection. Work within streams.
Upper Penitencia Creek, Coyote Creek to Dorel Drive	Flood protection, mitigation of project impacts, improve stream habitat, and reduce sedimentation. Work within streams.
Uvas Llagas Watershed	
Llagas Creek-Lower, Capacity Restoration, Hwy 152 to Pajaro River	Restore flood capacity in lower creek, and integrate flood protection with habitat protection to satisfy Endangered Species Act regulations. Work within streams.
Llagas Creek-Upper, Buena Vista Road to Wright Avenue	Flood protection. Work within streams.
Water Resources Stewardship Capital Improvements	
Environmental Enhancement	
Clean Safe Creeks Soap Lake Floodplain Property Acquisition	Create wetlands, riparian habitat, and favorable stream conditions for fisheries and wildlife. Work within streams.
Fish and Aquatic Habitat Collaborative Effort (FAHCE) Stevens Creek Fish Passage Enhancement	Restore and maintain steelhead population, provide suitable spawning and rearing habitat via operations plan, and provide steelhead passage. Work within streams.
Jacques Gulch Restoration	Remove mercury calcine deposits, stabilize stream banks, and restore habitat. Work within streams.
Pond A8 Applied Study Final Design and Construction	Restore tidal influence and wetland habitat.
Mitigation	
Ogier Ponds Separation from Coyote Creek	Construct pond improvements including eliminating temperature and predation traps and improving passage for Chinook and steelhead.
SMP Mitigation, Laguna Seca Freshwater Wetland	Create 30 acres of freshwater wetlands.
SMP Mitigation, Pajaro Basin Freshwater Wetland	Create 4 acres freshwater wetlands.
SMP Mitigation, Stream and Watershed Land Preservation	Environmental restoration of 10 acres.
Stewardship	
Alviso Sough Restoration	Vegetation removal for 3.7 acres and dredging to 8 feet depth to restore channel widths and expand open water habitat. Work within wetlands.
Regnart Creek Stream Stabilization, Bubb to Stelling Roads	Erosion repairs to reduce sedimentation. Work within streams.
Thompson Creek Stream Stabilization, Quimby to Aborn Roads	Restore low-flow channel and riparian habitat, and provide erosion protection. Work within streams.

Source: SCVWD 2010

4.5.2 Cumulative Impact Analysis

Cumulative Setting

The following key impacts are considered cumulatively significant in the context of current and future projects. The cumulative impact discussion is limited to these topics only.

Air Quality. The San Francisco Bay Area Air Basin (SFBAAB) has been designated by the Bay Area Air Quality Management District (BAAQMD) as being in non-attainment under both federal and state standards for ozone. Particulate matter $(PM)_{10}$ and $PM_{2.5}$ also are designated as in non-attainment under state standards. Several pollutants are undesignated at either the federal or state level: 24-hour PM_{10} and $PM_{2.5}$ concentrations under federal standards, and hydrogen sulfide and visibility-reducing particles under state standards. As growth occurs in the county, increased emissions of these and other pollutants could result in continued non-attainment status or new non-attainment designations.

In addition, as discussed in Section 3.5, *Global Climate Change*, anthropogenic emissions of greenhouse gases (GHGs) are widely accepted in the scientific community as contributing to global warming.

The BAAQMD has adopted specific quantitative and qualitative criteria that they recommend using to evaluate air quality impacts. The BAAQMD adopted CEQA thresholds for construction and operation are summarized in Tables 3.2-5 and 3.5-1. The BAAQMD's cumulative operation criteria for air pollutant and precursor emissions, including GHGs, are identical to their individual project thresholds. These thresholds represent the levels at which a project's individual emissions of criteria air pollutants, precursors, or GHGs would result in a cumulatively considerable contribution to the SFBAAB's existing air quality conditions.

As described in Section 3.2, *Air Quality*, proposed SMP maintenance activities would result in increased air pollutant emissions from on-road and off-road vehicles, including increases in nitrogen (NOx) emissions. These activities are estimated to result in the emission of 27.8 tons of nitrogen per year in 2012. Although daily vehicle activity would not change between 2012 and 2022, daily emissions are expected to decrease over this period as existing vehicles are replaced with lower-emission vehicles. Consequently, average daily vehicle emissions are expected to be much lower in 2022 (10.2 tons/year) compared to 2012. A portion of airborne NOx emissions are converted into forms that can fall to earth as depositional nitrogen. Weiss (1999) concluded that such nitrogen deposition effectively "fertilizes" serpentine habitats to the point that non-native annual grasses are better able to invade these nutrient-poor habitats, resulting in degradation of serpentine plant communities and the subsequent loss of the Bay checkerspot butterfly's native larval host plants.

The Santa Clara Valley Habitat Plan (ICF Jones & Stokes 2010) includes an analysis of the degree to which implementation of the Habitat Plan will increase nitrogen deposition. NOx emissions from sources within Santa Clara County were calculated at 42,340 tons/year in 2000, although total emissions from Santa Clara County as well as neighboring counties that could potentially contribute to nitrogen deposition on Bay checkerspot butterfly habitat in the Habitat Plan area was calculated at 934,801 ton/year. Based on these estimates, nitrogen emissions resulting from the SMP Update are expected to contribute a maximum of 0.07 percent of the total nitrogen emissions from sources within Santa Clara County and only 0.003 percent of total emissions from Santa Clara County and neighboring counties. Thus, the SMP Update is not expected to make a cumulatively considerable contribution to any cumulative impacts of nitrogen deposition on serpentine plant or animal communities.

Biological Resources. Although the various County and jurisdictional general plans (see Section 3.8, *Land Use and Planning*) contain policies addressing conservation and preservation of open space, ongoing development in the county is anticipated to result in the loss of riparian habitat, wetlands, and other sensitive natural communities. These outcomes likely will lead to direct take or loss of habitat for both common and special-status species.

As discussed in Section 3.3 *Biological Resources*, under Impact BIO-41, SCVWD currently is pursuing preparation of the Santa Clara Valley Habitat Plan, together with five other partners located in the county. The intent of this plan is to protect, enhance, and restore ecosystem integrity and functionality for threatened and endangered species; enhance the diversity of plant and animal communities; and conserve habitat and contribute to the recovery of species listed or likely to be listed under the federal ESA or the California ESA. In addition, SCVWD is pursuing preparation of the Three Creeks Habitat Conservation Plan, intended to cover ongoing operations and maintenance of eight existing dams and reservoirs in the Guadalupe River, Coyote Creek, and Stevens Creek watersheds. The goal of this plan is to restore and maintain healthy salmonid populations as appropriate to each of the three watersheds.

Because of the urban and agricultural context in which many creeks within the Project Area occur, the riparian, aquatic, and wetland habitats along these creeks represent the only (or at least highest-quality) habitat available to many species on the Valley floor. As a result, development within the county could lead to the cumulative fragmentation effects to habitat connectivity for plants and animals.

Cultural Resources. Similar to biological resources, the various County and jurisdictional general plans contain policies regarding preservation of important cultural resources. Regardless, ongoing development could lead to the cumulative loss of significant historic, archeological, or paleontological resources.

Land Use and Planning. As the county develops, land use conflicts or incompatibilities, such as those between agriculture or other non-urban uses and urban development at the urban growth boundary, could intensify.

Noise. As the county grows, the number of noise sources will multiply, and ambient noise levels are likely to increase in a variety of locations, particularly in urban areas and along transit corridors.

Public Services and Utilities. Similar to transportation infrastructure, provision of adequate water, wastewater, stormwater, and solid waste infrastructure will be key issues as the county continues to grow.

Traffic and Transportation. Automobile traffic congestion is already a severe problem throughout the county. Provision of an adequate automotive transportation network and reducing automobile traffic by providing alternative means of transportation are identified as key issues to be addressed in various County and jurisdictional general plans. Traffic conditions may worsen as development in the county continues.

Water Resources. Increased development in the county may lead to a variety of impacts on water resources, including increased demand for water supplies, new sources of point source and non-point source pollution, increased area of impervious surface and volume of stormwater runoff, and potential flooding impacts.

The geographic scope of the area potentially affected by the Proposed Project for water quality would include various surface waters in the county and downstream receiving waters, listed for water quality impairments under the CWA Section 303(d). Listed waterbodies and impairments include: Guadalupe River and San Francisco Bay for mercury; San Francisco Bay for polychlorinated biphenyls; San Francisco Bay Area Urban Creeks for pesticide toxicity; Pajaro River for fecal coliform (including Pajaro River, San Benito River, Llagas Creek and Tequisquita Slough), sediment (including San Benito River, Llagas Creek and Rider Creek), and nitrates (including Llagas Creek); and San Francisquito Creek for sediment.

Proposed Project-related sediment that is not reused by SCVWD or transferred to other entities for reuse would be disposed at a landfill. As discussed in Chapter 2, *Project Description*, collected sediment will be: reused at Bay Pond A8 or other ponds to support tidal habitat restoration efforts; disposed at a local landfill or an appropriate hazardous waste facility (e.g., Buttonwillow hazardous waste landfill); or disposed at other upland or aquatic sites (e.g., the abandoned quarry pond next to the Coyote Parkway site, the U.S. Fish and Wildlife Service refuge at Bair Island, and Phase 2 of the South Bay Salt Pond restoration effort). Reuse could have direct effects but also may have indirect effects if the reuse was part of a larger project.

4.5.3 Cumulative Impacts

Cumulative Impact AIR-1: Emissions of ROG, NOx, PM_{10}, and $PM_{2.5}$ (Less than Significant with Mitigation or Significant and Unavoidable)

Because of the non-attainment status for particulates (PM_{10} and $PM_{2.5}$) and ozone precursors (ROG and NOx) in the SFBAAB, emissions of these contaminants would be a significant cumulative impact. The discussion below describes how the Proposed Project activities could potentially contribute to this impact.

Vegetation Management

Vegetation management activities would involve the application of pesticides and vehicle use. Both of these activities would potentially emit particulates and ozone precursors. Use of zinc phosphide also could emit phosphine gas.

Other Maintenance Activities

All other proposed maintenance activities (bank stabilization, sediment removal, minor maintenance, management of animal conflicts, and canal maintenance activities) would include the use of vehicles and may require the use of heavy equipment. In addition, all of these activities may involve ground disturbance during the removal of sediments, stabilization of banks, site grading, or reconstruction of levee side slopes. Soil disturbance related to these activities would cause temporary emissions of particulate matter. Fuel combustion involved with operating heavy equipment, generators, and on-road vehicles used to dispose debris also would release particulate matter and other contaminants associated with motor vehicle operation, including carbon monoxide and ozone precursors (ROG and NOx).

Applicable Best Management Practices

The following BMPs would be implemented as part of the SMP Update to provide dust management during all Proposed Project activities. Descriptions of each BMP are provided in Chapter 2, *Project Description*.

BMP GEN-4: Minimize the Area of Disturbance
BMP GEN-29: Dust Management

Conclusion

With implementation of the BMPs above, emissions of criteria air pollutants other than NOx from the Proposed Project would occur at levels below the BAAQMD's cumulative significance thresholds. However, average daily and annual emissions of NOx from the Proposed Project would exceed the BAAQMD's cumulative significance thresholds, as described in Section 3.2, *Air Quality*. Therefore, the Proposed Project would make a considerable contribution to this significant cumulative air quality impact.

The District would implement Mitigation Measure AIR-1A, reducing NOx emissions by 20 percent, which would lower NOx emissions below the significance threshold in 2020, but not in 2012. As a result, this impact would remain significant after this mitigation.

Therefore, the District would implement either Mitigation Measure AIR-1B or AIR-1C to offset remaining annual NOx emissions in exceedance of BAAQMD significance thresholds. Implementation of either Mitigation Measure AIR-1B or AIR-1C would reduce this impact to a less-than-significant level. However, it is possible that these mitigation measures may not be feasible because of the considerations discussed below. If the District found these mitigation measures to be infeasible, then this impact would be considered significant and unavoidable.

Mitigation Measure AIR-1A Reduction in Fleet Emissions

Mitigation Measure AIR-1B Off-site NOx Emissions Mitigation Program

Mitigation Measure Air-1C: NOx Emissions Offsets

Cumulative Impact AIR-2: Emissions of Greenhouse Gases (Less than Significant with Mitigation or Significant and Unavoidable)

Emission of GHGs that would contribute to global climate change would be considered a significant cumulative impact. All of the Proposed Project's maintenance activities (vegetation management, sediment removal, bank stabilization, management of animal conflicts, minor maintenance, and canal maintenance) would release GHGs from the combustion of fossil fuels in on- and off-road vehicles, and portable power generators.

Conclusion

The Proposed Project's net emissions increase would exceed the BAAQMD's cumulative significance threshold of 1,100 metric tons CO_2e, as discussed in Section 3.5, *Global Climate Change*. Therefore, the Proposed Project would make a considerable contribution to this significant cumulative GHG impact. The District would implement Mitigation Measure AIR-1A, which would reduce NOx emissions by 20 percent, and also may reduce other GHG emissions. Although possible, this measure is not expected to reduce GHG emissions below the threshold. Therefore, this impact would remain significant after this mitigation.

Therefore, the District would implement either Mitigation Measure GCC-1A or GCC-1B, or a combination of both measures, to offset annual GHG emissions in exceedance of BAAQMD significance thresholds. Implementation of either Mitigation Measure GCC-1A or GCC-1B, or a combination of both measures, would reduce this impact to a less-than-significant level. However, it is possible that these mitigation measures may not be feasible because of the factors discussed below. If the District found these mitigation measures to be infeasible, then this impact would be considered significant and unavoidable.

Mitigation Measure AIR-1A Reduction in Fleet Emissions

Mitigation Measures: GCC-1A On-site or Off-site GHG Emissions Mitigation Program

Mitigation Measure GCC-1B: GHG Emissions Offsets

Cumulative Impact BIO-1: Effects on Biological Resources (Less than Significant with Mitigation)

The Proposed Project could potentially affect biological resources through habitat alterations or losses, as described further below.

All Proposed Project Activities

The proposed maintenance activities would involve sediment removal, bank stabilization, minor maintenance, management of animal conflicts, vegetation management, and canal maintenance. Any of the Proposed Project's activities could have the potential for impacts to a variety of biological resources, including the following:

- temporary disturbance or permanent loss of aquatic and upland natural communities;
- temporary disturbance or permanent loss of potential habitat for, and loss of individuals of, special-status plants, including:
  - serpentine-associated species (Santa Clara Valley dudleya, Metcalf Canyon jewel-flower, big-scale balsamroot, pink creamsacs, Mt. Hamilton thistle, San Francisco collinsia, fragrant fritillary, Loma Prieta hoita, woolly-headed lessingia, smooth lessingia, and most beautiful jewel-flower);
  - non-serpentine associated species (Franciscan onion, bent-flowered fiddleneck, Anderson's manzanita, brittlescale, round-leaved filaree, Congdon's tarplant, Santa Clara red ribbons, Hospital Canyon larkspur, western leatherwood, Hoover's button-celery, Satan's goldenbush, showy golden madia, arcuate bush-mallow, Davidson's bush-mallow, Hall's bush-mallow, Oregon meconella, Mt. Diablo cottonweed, robust monardella, hooked popcorn-flower, and saline clover);
- temporary disturbance or permanent loss of potential habitat for, and loss of individuals of, special-status animals, including:
  - special-status invertebrates (Bay checkerspot butterfly, Hom's micro-blind harvestman, Jung's micro-blind harvestman, and Opler's longhorn moth, mimic tryonia);
  - special-status fish (Central California Coast and South-Central Coast steelhead, Pacific lamprey, Monterey roach, longfin smelt, and green sturgeon);
  - special-status amphibians (California tiger salamander, California red-legged frog, and foothill yellow-legged frog);
  - special-status reptiles (western pond turtle and California horned lizard);
  - special-status birds (western snowy plover, black skimmer, California clapper rail, California black rail, redhead, American peregrine falcon, golden eagle, bald eagle, burrowing owl, short-eared owl, long-eared owl, northern harrier, white-tailed kite, Alameda song sparrow, Bryant's savannah sparrow, San Francisco

common yellowthroat, Least Bell's vireo, yellow warbler, yellow-breasted chat, grasshopper sparrow, loggerhead shrike, Vaux's swift, tricolored blackbird, and olive-sided flycatcher);

- special-status mammals (salt marsh harvest mouse, salt marsh wandering shrew, San Francisco dusky-footed woodrat, pallid bat, Townsend's big-eared bat, western red bat, American badger, ringtail, San Joaquin kit fox, and Pacific harbor seal);

- temporary disturbance or permanent loss of potential nesting habitat for, and active nests of, migratory birds, including raptors; and

- loss of heritage-sized trees.

The cumulative impact on biological resources resulting from the Proposed Project in combination with other projects in the Project Area would be dependent on the relative magnitude of adverse effects of these projects on biological resources compared to the relative benefit to these resources of impact avoidance and minimization efforts prescribed by planning documents, CEQA mitigation measures, and permit requirements for each project; compensatory mitigation and proactive conservation measures associated with each project; and the benefits to biological resources accruing from the habitat conservation plans (HCPs)being pursued by SCVWD and others. In the absence of such avoidance, minimization, compensatory mitigation, and conservation measures, cumulatively significant impacts to biological resources would occur.

Applicable Best Management Practices

The following BMPs would be implemented as part of the SMP Update to minimize potential cumulative impacts on biological resources. Descriptions of each BMP are provided in Chapter 2, *Project Description*.

GEN-4: Minimize the Area of Disturbance
GEN-5: Mitten Crab Control Measure
GEN-6: Minimize Impacts to Nesting Birds via Site Assessments and Avoidance Measures
<u>GEN-6.5: Protection of Nesting Least bell's vireo</u>
GEN-7: Protection of Burrowing Owls
GEN-8: Protection of Sensitive Fauna Species from Herbicide Use
GEN-9: Avoid Impacts to Special-Status Plant Species and Sensitive Natural Vegetation Communities
GEN-10: Avoid Impacts to Bay Checkerspot Butterfly and Associated Critical Habitat
GEN-11: Protection of Salt Marsh Harvest Mouse and California Clapper Rail
GEN-12: Protection of Special-Status Amphibian and Reptile Species
GEN-13: Protection of Bat Colonies
GEN-14: Protection of San Francisco Dusky-Footed Woodrat
GEN-15: Salvage Native Aquatic Vertebrates from Dewatered Channels
GEN-15.5: Avoidance of Impacts on the San Joaquin Kit Fox

Conclusion

Each of the County and jurisdictional general plans considered for this cumulative impact assessment contains conservation measures that would benefit biological resources, as well as measures to avoid, minimize, and mitigate impacts to these resources. Likewise, the two regional HCPs with which SCVWD is involved will result in a net benefit to biological resources. As a result, through CEQA documents and permit conditions (including the conditions of these HCPs), each project in the region would mitigate its contribution to biological resources, reducing cumulative impacts. Section 3.3, *Biological Resources* identifies a number of mitigation measures that would be implemented to reduce impacts to sensitive habitats and to both common and special-status species: Collectively, implementation of the Proposed Project's mitigation plan and CEQA mitigation measures would ensure that the Proposed Project's contributions to cumulative impacts on biological resources would not be considerable, with one exception (habitat fragmentation, which is considered separately in Cumulative Impact BIO-2: Habitat Fragmentation, below). With implementation of the following mitigation measures, the Proposed Project's contributions would be less than considerable.

Mitigation Measures:

Mitigation Measure BIO-1: Implement Compensatory Mitigation for Wetlands and Other Waters

Mitigation Measure BIO-2: Implement Compensatory Mitigation for Woody Riparian Vegetation

Mitigation Measure BIO-3: Implement Compensatory Mitigation for Serpentine Communities

Mitigation Measure BIO-4: Implement Compensatory Mitigation for Serpentine-Associated Special-Status Plant Species

Mitigation Measure BIO-5: Implement Compensatory Mitigation for Impacts to Non-Serpentine Special-Status Plant Species

Mitigation Measure BIO-6: Implement Compensatory Mitigation for Impacts to Serpentine-Associated Special-Status Invertebrates

Mitigation Measure BIO-7: Tree Replacement

Mitigation Measure BIO-8: Augmentation of Spawning Gravel

Mitigation Measure BIO-9: Augmentation of Instream Complexity for Non-Tidal Stream Fish

Mitigation Measure BIO-10: Implement Compensatory Mitigation for the California Tiger Salamander

Mitigation Measure BIO-11: Implement Compensatory Mitigation for the California Red-Legged Frog

Mitigation Measure BIO-12: Implement Compensatory Mitigation for the Least Bell's Vireo

Mitigation Measure BIO-13: Implement Compensatory Mitigation for the Burrowing Owl

Mitigation Measure BIO-14: Implement Compensatory Mitigation for the Yellow Warbler

Mitigation Measure BIO-15: Provide Alternative Bat Roost

Mitigation Measure-BIO-16: Invasive Plant Species Management Program

Cumulative Impact BIO-2: Habitat Fragmentation (Significant and Unavoidable)

Impacts to habitat connectivity as a result of habitat fragmentation would be a significant cumulative impact in Santa Clara County. As described in Impact BIO-40 in Section 3.3, *Biological Resources*, all of the Proposed Project activities would contribute to the Proposed Project's adverse habitat-related effects, including habitat loss and fragmentation of habitat connectivity.

Applicable Best Management Practices

The following BMPs would be implemented as part of the SMP Update to minimize potential cumulative impacts on habitat connectivity. Descriptions of each BMP are provided in Chapter 2, *Project Description*.

BMP GEN-4: Minimize the Area of Disturbance
BMP BANK-1: Bank Stabilization Design to Prevent Erosion Downstream

Conclusion

After the implementation of the compensatory mitigation described in Section 3.3, *Biological Resources*, impacts may remain for those species that could not easily move to undisturbed areas or mitigation sites. Because of the widespread nature of Proposed Project activities and the importance of riparian habitats and creeks in providing habitat connectivity throughout Santa Clara County, the combined effect of Proposed Project activities could have a considerable contribution to this significant cumulative impact. Conservation elements of other projects, such as general plans and the aforementioned HCPs, would reduce the effects of those projects on habitat connectivity, but those conservation elements are not expected to reduce cumulative impacts on habitat connectivity to less-than-significant levels. Therefore, the SMP Update's contribution to the cumulative impact on habitat connectivity resulting from habitat fragmentation would be considerable. No feasible mitigation would be possible except for that already identified to further reduce the Proposed Project's contribution to this cumulative impact. Therefore, this impact would remain significant and unavoidable.

Mitigation Measures: No mitigation is required in addition to those measures previously identified in Section 3.3, Biological Resources.

Cumulative Impact CR-1: Effects on Cultural Resources (Less than Significant)

Impacts on cultural resources, including historic, archeological, or paleontological resources, could occur primarily through ground disturbances associated with the Proposed Project activities.

Vegetation Management and Management of Animal Conflicts

Vegetation management and animal conflicts management generally would not involve activities that may affect cultural resources. Although unlikely, discing as part of vegetation management or physical habitat alterations for animal conflicts management could potentially result in demolition or modification of significant historic, archeological, or paleontological resources.

Sediment Removal and Bank Stabilization

Although unlikely, the use of heavy equipment for sediment removal and bank stabilization activities and the ground disturbances associated with these activities, including the potential creation of new access ramps, potentially could substantially affect cultural resources.

Minor Maintenance and Canal Maintenance

Minor maintenance activities could involve grading of small areas and potentially would result in similar effects on cultural resources as described above for sediment removal and bank stabilization. Because routine canal maintenance activities would include all general work activities, effects would be the same as described above for routine maintenance activities.

Applicable Best Management Practices

The following BMPs would be implemented as part of the SMP Update to minimize potential cumulative impacts on cultural resources. Descriptions of each BMP are provided in Chapter 2, *Project Description*.

BMP GEN-4: Minimize the Area of Disturbance
BMP GEN-23: Stream Access
BMP GEN-40: Discovery of Cultural Remains or Historic or Paleontological Artifacts
BMP GEN-41: Review of Projects with Native Soil

Conclusion

With the BMPs identified above, the Proposed Project is not anticipated to make a considerable contribution to cumulative impacts related to cultural resources. Therefore, the Proposed Project's contributions would be less than significant, and no mitigation would be required.

Mitigation Measures: No mitigation is required.

Cumulative Impact LU-1: Land Use Conflicts (Less than Significant)

In Santa Clara County, land use conflicts between urban uses and lands adjacent to the urban growth boundary are considered a potentially significant cumulative impact.

Sediment Removal/Bank Stabilization

The location of sediment removal and bank stabilization activities would be limited to SCVWD-owned lands, easements, or on parcels approved by the Board of Directors. In addition, as described in Section 3.8, *Land Use and Planning*, Proposed Project-related disturbances to adjacent land uses would be temporary and would cease on completion of the maintenance activities. These activities would not cause permanent land use incompatibilities or conflicts with adopted plans or policies. Sediment removal and bank stabilization activities would not include the development of any housing or utilities and would not induce substantial population growth, directly or indirectly.

Other Maintenance Activities

Other SMP maintenance activities (vegetation management, management of animal conflicts, minor maintenance, and canal maintenance) would have similar effects as those described above for sediment removal and bank stabilization activities.

Applicable Best Management Practices

All of the BMPs described in Chapter 2, *Project Description*, would be applicable to the Proposed Project's compliance with applicable land use plan and policy categories.

Conclusion

Because the Proposed Project would be consistent with existing plans and would not interfere with adjacent land uses, the Proposed Project would not make a considerable contribution to cumulative impacts related to land use and planning. Therefore, the Proposed Project's contributions would be less than significant and no mitigation would be required.

Mitigation Measures: No mitigation is required.

Cumulative Impact NZ-1. Project-Related Noise Emissions (Less than Significant)

Noise generated from past, present, and reasonably foreseeable future growth in Santa Clara County is considered a potentially significant cumulative impact.

Sediment Removal and Bank Stabilization

Equipment used to conduct sediment removal and bank stabilization activities, such as bulldozers, excavators, front-end loaders, dump trucks, gradalls, and tractor mowers would generate noise. Although construction noise in any given location would be short term, many Proposed Project activities could increase ambient noise levels by 3 decibels or more, and/or result in exterior noise levels in excess of 75 dBA (A-weighted decibels), within 50 feet of residences that may be sensitive to noise. Noise impacts of the Proposed Project would be dispersed throughout the county.

Vegetation Management

Vegetation management activities would include the use of mowers and hand-held devices (chainsaws, hand sprayers, etc.) that would generate noise at levels similar or less than those described above for sediment removal and bank stabilization activities.

Other Maintenance Activities

The other Proposed Project activities (minor maintenance, canal maintenance, and management of animal conflicts) also would involve various noise-generating activities. Minor maintenance activities may involve the use of heavy equipment for grading of small areas or minor sediment removal. Because routine canal maintenance activities would include all general work activities, effects would be the same as described above for other routine maintenance activities. In general, animal conflict management activities would not be very loud but could require the use of heavy equipment to physically alter facilities (e.g.. levee surface compaction or reconstruction of levee side slopes).

Applicable Best Management Practices

The following BMPs would be implemented as part of the SMP update to reduce cumulative impacts from noise. Descriptions of each BMP are provided in Chapter 2, *Project Description*.

BMP GEN-36: Public Outreach
BMP GEN-38: Minimize Noise Disturbances to Residential Areas

Conclusion

The Proposed Project would require maintenance workers to employ noise reducing practices in residential areas or to notify the public before the start of maintenance activities. Because the Proposed Project would not result in any long-term increases in noise in any particular location, the Proposed Project is not considered to make a considerable contribution to cumulative impacts related to noise generation. Therefore, the Proposed Project's contributions would be less than significant, and no mitigation would be required.

Mitigation Measures: No mitigation is required.

Cumulative Impact TR-1: Disruption to Automobile Traffic Patterns (Less than Significant)

Automobile traffic congestion in Santa Clara County resulting from past, present, and reasonably foreseeable future growth is considered a potentially significant cumulative impact.

Sediment Removal/Bank Stabilization

Sediment removal and bank stabilization activities would generate traffic in the form of maintenance equipment, deliveries of materials, sediment disposal, fill hauling, and worker trips. Additionally, maintenance activities may require temporary road or lane closures. Traffic effects in any given location would be short term.

Other Maintenance Activities

Similar to sediment removal and bank stabilization activities, other proposed maintenance activities (vegetation management, minor maintenance, management of animal conflicts, and canal maintenance) would generate traffic related to maintenance equipment and worker trips, and would require temporary lane or road closures.

Applicable Best Management Practices

The following BMPs would be implemented as part of the SMP Update to minimize potential cumulative impacts on traffic and transportation. Descriptions of each BMP are provided in Chapter 2, *Project Description*.

BMP GEN-36: Public Outreach
BMP GEN-37: Implement Public Safety Measures
BMP GEN-39: Planning for Pedestrians, Traffic Flow, and Safety Measures

Conclusion

The Proposed Project would minimize effects on traffic, including public outreach, maintenance of two-way traffic flow on public roadways, and maintenance of public safety. Accordingly, the Proposed Project would not make a considerable contribution to cumulative impacts related to traffic. Therefore, the Proposed Project's contribution would be less than significant, and no mitigation would be required.

Mitigation Measures: No mitigation is required.

Cumulative Impact PSU-1: Effects on Public Services and Utilities (Beneficial)

The Proposed Project could affect public services and utilities if it resulted in an increased demand for additional water, wastewater, or stormwater infrastructure, or generated solid waste that would exceed the capacity of landfills or other receiver sites.

Bank Stabilization

The proposed bank stabilization activities would require limited quantities of water, which would be provided by SCVWD water trucks, for dust control and/or vehicle cleaning during the activities. As described in Section 3.10, *Public Services and Utilities*, no water infrastructure would be needed for bank stabilization activities. Portable restrooms would be used during these short-term activities and no long-term wastewater infrastructure would be required. Bank stabilization activities would enhance the functioning of current

stormwater infrastructure by repairing unstable stream or channel banks. These activities would provide flood management benefits and could reduce the likely threat of flooding. Bank stabilization activities may require the disposal of sediments, which would be reused for wetland restoration projects (e.g., Pond A8) or disposed at local landfills (or, for hazardous materials, disposed at the Buttonwillow landfill). Local landfills would have sufficient capacity to accept solid waste from the Proposed Project and other generators, as shown in Table 3.10-1. As described in Section 3.6, *Hazards and Hazardous Materials*, the Buttonwillow landfill was built with a capacity of 13,325,000 cubic yards and has used less than 10 percent of this capacity (Clean Harbors 2010a, DTSC 2008). The landfill is capable of accepting large quantities of waste (Winwood, pers. comm., 2011). The disposal of any sediments from the Proposed Project's bank stabilization activities would not result in a cumulative exceedance of the capacity of a landfill.

Sediment Removal

Effects on water and wastewater utilities from the proposed sediment removal activities would be similar to those described above for bank stabilization activities. Sediment removal activities would have a beneficial effect on stormwater infrastructure by removing sediments from canals and creeks and restoring the conveyance capacity of flood protection channels of the Project Area. As described in Section 3.10, *Public Services and Utilities*, sediments would be disposed at Pond A8 or the Buttonwillow landfill, depending on the sediment quality. As described above, Buttonwillow has sufficient capacity to accept the Proposed Project's anticipated sediment quantities as well as contributions from other sediment generators.

Vegetation Management

Effects on water, stormwater, wastewater utilities from vegetation management activities would be similar to those described above for bank stabilization activities. As described in Section 3.10, *Public Services and Utilities*, the Proposed Project likely would involve the removal of other materials, including vegetation that could be disposed at local Santa Clara County landfills.

Other Maintenance Activities

Minor maintenance, canal maintenance, and management of animal conflicts may result in a need for sediment or solid waste disposal. As described previously, local landfills and regional hazardous waste landfills would have sufficient capacity to accept these wastes, in addition to the wastes of other generators. Furthermore, effects related to water, stormwater, and wastewater utilities would be similar to that described for bank stabilization activities.

Applicable Best Management Practices

The following BMPs would be implemented as part of the SMP Update to minimize potential cumulative impacts on public services and utilities. Descriptions of each BMP are provided in Chapter 2, *Project Description*.

BMP GEN-3: Avoid Exposing Soils with High Mercury Levels
BMP GEN-4: Minimize the Area of Disturbance
BMP GEN-23: Stream Access
BMP GEN-27: Existing Hazardous Sites
BMP GEN-36: Public Outreach
BMP GEN-37: Implement Public Safety Measures
BMP GEN-39: Planning for Pedestrians, Traffic Flow, and Safety Measures
BMP GEN-42: Investigation of Utility Line Locations

Conclusion

During maintenance activities, the Proposed Project would be implemented to minimize any potential interruptions to public services and utilities systems, and would not require the construction of any additional public services and utilities systems. The Proposed Project would not generate the need for water or wastewater infrastructure, or result in solid waste disposal needs that would exceed the capacity of landfills or other receiver sites. Furthermore, the Proposed Project would make a positive contribution with respect to maintaining stormwater infrastructure. Therefore, the Proposed Project would be beneficial from the standpoint of cumulative impacts related to public services and utilities systems, and no mitigation would be required.

Mitigation Measures: No mitigation is required.

Cumulative Impact WQ-1: Effects on Water Quality (Less than Significant)

Under CWA Section 303(d), further degradation to impaired surface waters constitutes a significant cumulative impact. Ground-disturbing or sediment-disturbing activities associated with the Proposed Project potentially could result in discharges of sediment or other sediment-adsorbed contaminants.

Sediment Removal/Bank Stabilization/Minor Maintenance

Sediment removal, bank stabilization, and minor maintenance activities would involve a variety of mostly in-channel, ground-disturbing activities, including grading, development of new access ramps to creek channels, bank stabilization, and/or sediment removal activities. Grading activities for minor maintenance also may be performed outside of stream channels. Installation and removal of flow diversion structures for these activities would involve streambed and bank disturbance that could cause increased turbidity in the water column surrounding the work site and migration of sediment downstream. Although sediment or contaminant waste discharges only would occur at any particular site when maintenance activities occurred and would be short term, discharges could reach impaired downstream water bodies.

Vegetation Management

Vegetation removal and discing could occur as part of vegetation management activities and potentially would have similar water quality effects as other ground-disturbing activities described above for other routine maintenance activities.

Management of Animal Conflicts

Management of animal conflicts potentially could affect water quality via ground-disturbing activities related to physical alteration of habitats, such as levee side slope reconstruction. Potential effects of these sediment-disturbing activities would be similar to those described above for other routine maintenance activities.

Canal Maintenance

Because routine canal maintenance activities would include all general work activities, effects would be the same as described above for other routine maintenance activities.

Applicable Best Management Practices

The following BMPs would be implemented as part of the SMP Update to minimize potential cumulative impacts on water quality. Descriptions of each BMP are provided in Chapter 2, *Project Description*.

BMP GEN-1: In-Channel Work Window
BMP GEN-4: Minimize the Area of Disturbance
BMP GEN-16: In-Channel Minor Activities
BMP GEN-20: Erosion and Sediment Control Measures
BMP GEN-23: Stream Access
BMP GEN-24: On-Site Hazardous Materials Management
BMP GEN-25: Existing Hazardous Materials
BMP GEN-26: Spill Prevention and Response
BMP GEN-30: Vehicle and Equipment Maintenance
BMP GEN-32: Vehicle and Equipment Fueling
BMP GEN-33: Dewatering for Non-Tidal Sites
BMP GEN-34: Dewatering in Tidal Work Areas
BMP GEN-35: Pump/Generator Operations and Maintenance
BMP SED-1: Groundwater Management
BMP SED-2: Prevent Scour Downstream of Sediment Removal
BMP SED-3: Restore Channel Features
BMP SED-4: Berm Bypass
BMP VEG-1: Minimize Local Erosion Increase from In-Channel Vegetation Removal
BMP VEG-3: Use Appropriate Equipment for Instream Removal
BMP BANK-1: Bank Stabilization Design to Prevent Erosion Downstream
BMP BANK-2: Concrete Use near Waterways
BMP BANK-3: Bank Stabilization Post-Construction Maintenance
BMP REVEG-1: Seeding
BMP REVEG-2: Planting Material

Conclusion

As discussed in Section 3.13, *Water Quality*, the Proposed Project would minimize potential impacts from maintenance activities to water quality and 303(d) listed streams. The Proposed Project would therefore not make a considerable contribution to cumulative impacts related to water quality. On this basis, the Proposed Project's contribution would be less than significant, and no mitigation would be required.

Mitigation Measures: No mitigation is required.

Chapter 5
ALTERNATIVES ANALYSIS

5.1 Introduction

This chapter describes alternatives to the Proposed Project and evaluates their environmental impacts. This alternatives analysis was developed to serve three regulatory purposes: (1) CEQA compliance; (2) National Environmental Policy Act (NEPA) compliance; and (3) Clean Water Act Section 404(b)(1) permitting requirements. Although this DSEIR addresses CEQA requirements, NEPA and 404(b)(1) environmental review activities for the Proposed Project are occurring in parallel as part of the U.S. Army Corps of Engineers (USACE) permitting process. The analysis in this chapter is anticipated to be used by the USACE to develop its NEPA documentation and 404(b)(1) analyses. Therefore, this chapter considers those NEPA regulatory requirements and provides a consistent evaluation for each.

A detailed description of the regulatory requirements for consideration of alternatives is provided in Section 5.2, *Regulatory Requirements*. The chapter continues with a description of the alternatives development process, alternatives that were considered, and alternatives that were considered but dismissed from detailed analysis. The chapter concludes with identification of the environmentally superior alternative.

5.2 Regulatory Requirements

CEQA/NEPA Requirements

CEQA requires that an EIR, and NEPA requires that an environmental assessment (EA) or environmental impact statement (EIS), evaluate a reasonable range of alternatives to the proposed action, including an alternative where no project would be developed. Although no clear rule exists for determining a reasonable range, CEQA and NEPA provide guidance that can be used to define the range of alternatives for consideration in the environmental document. According to NEPA, the range of alternatives required is governed by the rule of reason, which requires an EA or EIS to set forth only those alternatives necessary to allow for a reasoned decision regarding the proposed action. An EA or EIS must consider a reasonable range of options as defined by the specific facts and circumstances of the proposed action. First, alternatives must fulfill the basic purpose and need for the action. Second, alternatives to be analyzed should not have more significant impacts on the environment than the proposed action or result in impacts that are indistinguishable from those of the proposed action. Furthermore, alternatives must be able to be feasibly carried out in the context of technical, economic, environmental, and other factors. If alternatives have been eliminated from detailed study, the EA or EIS must briefly discuss the reason for their elimination (40 CFR 1502.14[a]; Forty Questions No.1[a]).

The range of alternatives under CEQA is similarly governed by the rule of reason. Alternatives under CEQA must meet the basic project objectives, should reduce or eliminate one or more of the significant impacts of the proposed project (although the alternative can have greater impacts overall), and must be feasible. In determining whether alternatives are feasible, lead agencies are guided by the general definition of feasibility found in State CEQA Guidelines Section 15364: "capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social, and technological factors." In accordance with State CEQA Guidelines Section 15126.6[f], the lead agency must consider site suitability, economic viability, availability of infrastructure, general plan consistency, other regulatory limitations, jurisdictional boundaries, and the proponent's control over alternative sites in determining the range of alternatives to be evaluated in an EIR. An EIR must briefly describe the rationale for selection and rejection of alternatives and the information that the lead agency relied on in making the selection. It should also identify any alternatives that were considered by the lead agency but were rejected as infeasible during the scoping process and briefly explain the reason for their exclusion (State CEQA Guidelines Section 15126[d][2]). These guidelines were used in developing the alternatives and their evaluation, as described below.

A No Action (NEPA)/No Project (CEQA) Alternative also is required to be considered. The No Action/No Project alternative allows decision makers to compare the impacts of approving the action against the impacts of not approving the action.

Clean Water Act Section 401(b)(1)

Under 40 CFR Part 230 Section 401(b)(1), discharge of dredged or fill material will not be permitted if a practicable alternative exists to the proposed discharge that will have a lesser adverse impact on the aquatic ecosystem. However, the alternative cannot have other significant adverse environmental consequences that are greater than that of the proposed discharge.

For the purpose of this requirement, practicable alternatives include, but are not limited to:

- activities that do not involve a discharge of dredged or fill material into the waters of the United States or ocean waters; and
- discharges of dredged or fill material at other locations in waters of the United States or ocean waters.

Because Proposed Project activities would be necessarily water-dependent, alternatives which would not involve a discharge of dredged or fill material into waters of the United States were not considered. Additionally, the Project Area is specifically defined, based on maintenance needs for the region's flood protection channels. Because the Project Area was determined by fundamental Proposed Project needs, this precluded consideration of alternative locations for discharges outside of the Project Area. An alternative is practicable if it is available and capable of being undertaken after taking into consideration cost, existing technology, and logistics in light of overall project purposes. If it is otherwise a practicable alternative, an area not presently owned by the applicant that can reasonably be

obtained, utilized, expanded or managed to fulfill the basic purpose of the proposed activity may be considered.

For actions subject to NEPA, where the U.S. Army Corps of Engineers (USACE) is the permitting agency, the analysis of alternatives required for NEPA environmental documents, including supplemental USACE NEPA documents, will in most cases provide the information for the evaluation of alternatives under the Section 401(b)(1) guidelines. On occasion, these NEPA documents may not have considered the alternatives in sufficient detail to respond to the requirements of the 401(b)(1) guidelines, and it may be necessary to supplement the NEPA documents with this additional information.

5.3 Alternatives Development Process

Alternatives to the SMP Update were developed as programmatic alternatives to implementation of the Proposed Project as a whole. Some of the alternatives considered would limit the extent of Proposed Project implementation by altering the frequency of maintenance activities or prohibiting maintenance activities from occurring on specific stream reaches. As a result, the programmatic alternatives would provide varying levels of flood protection. Alternatives were developed by considering the Proposed Project's overall goals and objectives as well as by its potential environmental impacts. Alternatives would seek to achieve similar goals as the Proposed Project, although the alternatives may reach these goals to a greater or lesser extent than the Proposed Project. The alternatives also would seek to reduce the significance of anticipated adverse environmental impacts associated with the Proposed Project. A reasonable range of alternatives is presented in Section 5.4, *Alternatives Considered*, describing their potential impacts as well as benefits.

5.3.1 Project Goals and Objectives

The SMP Update was developed to achieve the following goals and objectives:

- Maintain the design flow or appropriate conveyance capacity of SCVWD facilities
- Maintain the structural and functional integrity of SCVWD facilities
- Remove sediment to maintain the hydraulic, safety, and habitat functions of creek systems
- Manage vegetation to maintain the hydraulic, safety, and habitat functions of creek systems, and allow for levee inspections and maintenance access
- Stabilize beds and banks of creeks and canals to protect existing infrastructure, maintain public safety, reduce sediment loading, protect water quality, and protect habitat values
- Avoid, minimize, or mitigate impacts on the environment by incorporating stream stewardship principles into maintenance activities

5.3.2 Significant Environmental Impacts of the Proposed Project

The following impacts have been identified as potentially significant, but they would be mitigated to a less-than-significant level by implementation of mitigation measures:

- **Impact BIO-1**: Loss or Disturbance of Wetlands and Other Waters
- **Impact BIO-2**: Loss or Disturbance of Woody Riparian Vegetation
- **Impact BIO-3**: Disturbance of Sensitive Plant Communities
- **Impact BIO-4**: Impacts to Serpentine-Associated Special-Status Plant Species
- **Impact BIO-5**: Impacts to Non-Serpentine Special-Status Plant Species
- **Impact BIO-6**: Impacts to Serpentine-Associated Special-Status Invertebrates
- **Impact BIO-7**: Loss of Ordinance Trees
- **Impact BIO-8**: Impacts on Steelhead
- **Impact BIO-9**: Impacts on the Pacific Lamprey and Monterey Roach
- **Impact BIO-10**: Impacts on the Longfin Smelt and Green Sturgeon
- **Impact BIO-11**: Impacts on the California Tiger Salamander
- **Impact BIO-12**: Impacts on the California Red-Legged Frog
- **Impact BIO-14**: Impacts on Non-Special-Status Fish and Amphibians
- **Impact BIO-16**: Impacts on the Western Pond Turtle
- **Impact BIO-20**: Impacts on the California Clapper Rail and Alameda Song Sparrow
- **Impact BIO-23**: Impacts on the Least Bell's Vireo
- **Impact BIO-24**: Impacts on the Burrowing Owl
- **Impact BIO-27**: Impacts on the Yellow Warbler
- **Impact BIO-28**: Impacts on the Yellow-Breasted Chat
- **Impact BIO-35**: Impacts on the Salt Marsh Harvest Mouse and Salt Marsh Wandering Shrew
- **Impact BIO-37**: Impacts on the Pallid Bat
- **Impact BIO-44**: Introduction of Invasive Species
- **Cumulative Impact BIO-1**: Effects on Biological Resources

5.3.3 Significant and Unavoidable Environmental Impacts of the Proposed Project

The following impacts have been identified as significant and unavoidable:

- **Impact AES-3:** Temporary Alteration of Visual Character or Quality from Maintenance Activities
- **Impact AES-4:** Permanent Alteration of Visual Character or Quality from Maintenance Activities
- **Impact AIR-1:** Temporary Increase in ROG, NOx, PM_{10}, and $PM_{2.5}$ Emissions during Maintenance Activities
- **Impact Bio-45:** Habitat Fragmentation
- **Impact GCC-1**: Temporary Increase in GHGs during Maintenance Activities
- **Impact NZ-1:** Temporary Exposure of the Public to Noise Levels in Excess of City or County Standards
- **Impact NZ-3:** Temporary Substantial Increase in Noise above Ambient Levels
- **Cumulative Impact AIR-1**: Emissions of ROG, NOx, PM_{10}, and $PM_{2.5}$
- **Cumulative Impact AIR-2**: Emissions of Greenhouse Gases
- **Cumulative Impact Bio-2:** Habitat Fragmentation

5.4 Alternatives Considered

The following alternatives were considered because they would meet most of the Proposed Project objectives, would be feasible, and would avoid or substantially reduce one or more significant impacts of the Proposed Project:

- No Project Alternative
- Reduced Frequency Alternative
- Limited Work in Unmodified Channels Alternative
- Limited Activities Alternative

Table 5-1 provides a comparison of alternatives to the Proposed Project, focusing on notable changes in characteristics and adverse and beneficial impacts.

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Table 5-1. Comparison of Alternatives

Alternative	Notable Comparisons to Proposed Project		
	Changes in Characteristics	**Adverse Impacts**	**Beneficial Impacts**
No Project Alternative	• Either use of existing BMPs, or BMPs varying on a project-by-project basis • Uses current maintenance period; no extension • If project-by-project permits are sought, some maintenance may not occur in the year it was needed because of increased time and effort to conduct CEQA compliance and obtain permits annually • If project-by-project permits are sought, biological impacts would be mitigated annually instead of comprehensively	• If work could not be conducted in a timely manner because of permit constraints, potential failure to maintain the design flow, or appropriate conveyance capacity of facilities resulting from sediment accumulation • Various impacts could increase because existing BMPs may not be as protective as proposed BMPs	• Slight reduction in annual impacts associated with SMP Update activities if less annual maintenance would be conducted
Reduced Frequency Alternative	• Recurrence of sediment removal and vegetation management activities at any location would be half as frequent as under the Proposed Project • The amount of maintenance done during each event likely would need to be greater to fulfill maintenance needs	• Temporary failure to maintain the design flow or appropriate conveyance capacity of facilities between maintenance activities • Temporary increased fire risk on roads and levees • Various impacts likely to increase in intensity because larger maintenance events would occur	• Impacts of sediment removal and vegetation management would occur less frequently
Limited Work in Unmodified Channels Alternative	• Maintenance activities that could be done in unmodified channels would be limited to within 100 feet up- and downstream of human-made structures • Maintenance activities in unmodified channels located away from human-made structures would not occur	• Potential failure to maintain the design flow or appropriate conveyance capacity of facilities resulting from increased sediment accumulation in locations where no work was allowed • Potential adverse impacts to water quality from increased sediment accumulation because of bank failures in areas where no work was allowed	• Potentially would reduce impacts to plant and animal species, riparian habitat, and wetlands in unmodified reaches • Various impacts would be reduced overall because less annual maintenance would be conducted

Table 5-1. Comparison of Alternatives

Alternative	Notable Comparisons to Proposed Project		
	Changes in Characteristics	**Adverse Impacts**	**Beneficial Impacts**
Limited Activities Alternative	• Only "soft" bank stabilization measures would be used; no hardscape would be allowed • Equipment for sediment removal would always be located at the top of the bank and would not be allowed in the stream channel • No herbicides would be used for vegetation management; only mechanical methods or hand removal would be utilized • No rodenticides would be used for management of animal conflicts	• Potential failure to maintain the design flow or appropriate conveyance capacity of facilities resulting from the inability to remove sediment inaccessible from top of bank • Likely greater impacts to vegetation/habitat from trampling because of repeated hand or mechanized vegetation removal • Potential variety of new/or greater impacts related to alternative methods of implementing maintenance activities • Direct loss of riparian habitat and sediment discharges potentially resulting from repeated bank failures where soft methods were not sufficient • Non-native species and species densities likely to increase because of less effective control methods; longer term result would be a loss of native flora and conversion to higher density non-natives	• Potentially reduced impacts to water quality from eliminating the use of herbicides and rodenticides • Reduced instream impacts from not allowing large equipment in the channel for sediment removal • Increased ecological value at bank stabilization sites where soft measures were used successfully

Source: Data compiled by Horizon Water and Environment in 2011

5.4.1 No Project Alternative

Characteristics of this Alternative

Under the No Project Alternative, SCVWD would pursue one of two options: (1) continue conducting maintenance activities, including CEQA compliance and project-by-project permitting on an annual basis, following practices under the existing SMP; or (2) seek to extend or renew existing SMP programmatic permits, following practices under the existing SMP and utilizing previous CEQA documentation. SCVWD would continue conducting the same maintenance activities under the existing SMP, using existing operation and maintenance guidelines and BMPs. A primary difference between this alternative and the Proposed Project is that the Proposed Project would include an extension of the end date of the maintenance period, from October 15 to December 31, as long as weather remained dry. In addition, this alternative would conduct maintenance projections to determine future work locations and extent. If project-by-project permitting was conducted, the BMPs may be

modified on a project-by-project basis, as dictated by mitigation contained in CEQA compliance documents and the terms contained in annually renewed permits.

The No Project Alternative could require SCVWD to conduct CEQA compliance and obtain permits on an annual basis, requiring more time and effort annually compared to the Proposed Project. Because of the lead time needed to obtain regulatory permits, some needed maintenance likely would not be conducted during the same season as the need for it was identified, resulting in the potential for failure to maintain the design flow or appropriate conveyance capacity of facilities. Therefore, possibly less maintenance work would be accomplished each year. If less sediment removal were to occur, sediment removal activities (such as truck trips for hauling and disposal/reuse) also would be reduced. Additionally, under this alternative over the 10-year planning horizon (2012-2022), annual environmental compliance costs required for the No Project Alternative would be expected to be higher than the one-time compliance costs associated with the Proposed Project.

Impact Analysis

The type and nature of environmental impacts resulting from the No Project Alternative could be expected to be similar to those of the Proposed Project. However, if less maintenance work was completed each year, then maintenance activities would be performed at each reach less frequently and/or less work would be completed overall. As a result, impacts related to aesthetics, air quality, biological resources, cultural resources, noise, recreation, traffic, geomorphology, and water quality would be slightly reduced. For instance, a longer period between maintenance activities would allow biological systems more time to restore ecological structure and function, resulting in somewhat reduced impacts to wetland and riparian habitats and other biological resources, when compared to the Proposed Project. To the extent that maintenance activities would improve ecological structure and function or remediate problems (for instance, bank stabilization to reduce sediment discharges to creeks), these benefits would not be realized to the same extent as under the Proposed Project.

If project-by-project permitting occurred, sediment discharges from areas requiring bank stabilization, combined with increased sediment accumulation resulting from the longer period between maintenance activities, would result in a greater temporary reduction in conveyance capacity than the Proposed Project. Consequently, the No Project Alternative would not be expected to maintain the design flow or appropriate conveyance capacity of facilities to the same extent as the Proposed Project. This would certainly be the case in channels that are included in the Proposed Project but not a part of the existing SMP.

Continued use of the BMPs in the current SMP, to the extent they are not as protective as the BMPs proposed for the SMP Update, may not reduce the impacts of maintenance to the same extent as under the Proposed Project. Furthermore, because SCVWD may not know what the mitigation requirements would be more than one year in advance, biological impacts then would need to be mitigated on an annual basis. Therefore, because mitigation would be undertaken in smaller increments, the overall mitigation may be less ecologically significant than the comprehensive approach proposed in the SMP Update, where

maintenance projects are pooled together annually or over a longer timeframe for the purpose of identifying mitigation opportunities.

5.4.2 Reduced Frequency Alternative

Characteristics of this Alternative

Under the Reduced Frequency Alternative, the types of maintenance activities undertaken by SCVWD would not change, but the recurrence of sediment removal and vegetation management activities would occur less frequently than under the Proposed Project. However, bank stabilization, management of animal conflicts, and minor maintenance activities would continue to occur as needed. All other aspects of the Proposed Project (e.g., the proposed BMPs) would be implemented under this alternative.

Under the Proposed Project, the recurrence of activities is projected for a 10-year period and would be influenced by a variety of factors, including the type of maintenance activity, where that activity would occur (e.g., levee or bank; unmodified channel or canal), and the site-specific factors at a particular location (e.g., rate of sediment accumulation or vegetation growth). The need for sediment removal or instream vegetation management typically would be based on field observations of reduced channel capacity from sediment accumulation or vegetation growth; non-instream vegetation management would be based on managing annual growth, including the removal of vegetation using both pre-emergent and post-emergent herbicides. Under the Reduced Frequency Alternative, the recurrence of sediment removal and vegetation management activities at any particular location would be half as frequent as under the Proposed Project. For example, if a stream reach was projected in the Proposed Project to need sediment removed in 4 out of 10 years, under the Reduced Frequency Alternative, sediment would be removed in 2 out of 10 years. Table 5-2 shows the 10-year average recurrence of sediment removal and instream and non-instream vegetation management activities under the Proposed Project and the Reduced Frequency Alternative.

Although maintenance activities would occur less frequently, the amount of maintenance done during each event likely would need to be greater to fulfill maintenance needs. For instance, a greater amount of sediment removal or instream vegetation management would need to occur during a maintenance event to maintain the design flood flow conveyance capacity during the longer periods between maintenance episodes. A greater amount of non-instream vegetation management also would need to occur during a maintenance event, to address fire hazards on roads and levees associated with a greater amount of vegetation growth. Similarly, different types of maintenance may be necessary (e.g., removal of larger trees may require larger equipment).

Table 5-2. Reduced Frequency Alternative 10-Year Recurrence of Sediment Removal and Vegetation Management Activities

Maintenance Type	Proposed Project 10-Year Average Recurrence	Reduced Frequency Alternative 10-Year Average Recurrence
Sediment Removal	2.8	1.4
Instream Vegetation Management		
Herbicide	8.9	4.5
Hand Removal	3.0	1.5
Hand Pruning	2.1	1.1
Non-Instream Vegetation Management		
Mowing	9.6	4.8
Herbicide	14.2	7.1
Hand Removal	2.6	1.3
Hand Pruning	2.4	1.2
Discing	10	5

Note:
In reality maintenance events would not occur as fractions. This table is intended to demonstrate the average rate that these activities would occur over the entire Project Area.
Source: Data compiled by Horizon Water and Environment in 2011

Impact Analysis

The type and nature of environmental impacts resulting from the Reduced Frequency Alternative is expected to be very similar to those of the Proposed Project. Compared to the Proposed Project, impacts theoretically would be reduced because maintenance events would occur less frequently; however, this may be offset by the increased intensity associated with the less frequent, larger maintenance events. The frequency and intensity of maintenance events would affect impacts related to aesthetics, air quality, biological resources, cultural resources, noise, recreation, traffic, geomorphology, and water quality. For instance, the longer period between maintenance activities would allow biological systems more time to restore ecological structure and function, resulting in somewhat reduced impacts to wetland and riparian habitats and other biological resources, when compared to the Proposed Project. To the extent that maintenance activities support or improve ecological structure and function (for instance, create conditions unfavorable to invasive exotic species), these benefits would not be realized to the same extent as under the Proposed Project.

Increased sediment accumulation and instream vegetation caused by the longer period between maintenance activities would result in a greater temporary reduction in conveyance capacity, and thus a reduction in the maintenance of the design flow or appropriate conveyance capacity of facilities, than under the Proposed Project. However, because larger maintenance events would occur, flood flow conveyance capacity would be retained over the long term. Increased non-instream vegetation growth caused by the

longer period between maintenance activities would result in greater temporary fire hazards on roads and levees than under the Proposed Project. Local fire code requirements would not be able to be met annually.

5.4.3 Limited Work in Unmodified Channels Alternative

Characteristics of this Alternative

Under the Limited Work in Unmodified Channels Alternative (Limited Work Alternative), maintenance activities that could be done in unmodified channels would be limited to within 100 feet up- and downstream of human-made structures, such as bridges, road crossings, stream gages, outfalls, and trash racks. As a result, a reduced amount of annual maintenance would occur under this alternative. Maintenance near human-made structures would be necessary because it would keep these structures functioning properly and safely. Necessary maintenance activities in unmodified channels located away from human-made structures would not occur, resulting in a reduction in the maintenance of the design flow or appropriate conveyance capacity of facilities, or in unaddressed maintenance needs. If less sediment removal and vegetation management were to occur, specific aspects of the work associated with these activities (such as truck trips for hauling and disposal/reuse) also would be reduced. All other aspects of the Proposed Project (e.g., the proposed BMPs) would be implemented under this alternative. To help illustrate this alternative, Figure 5-1 shows the locations of the unmodified channels.

Impact Analysis

The primary goal of the Limited Work Alternative would be to reduce impacts to biological resources in unmodified channels. Although a range of ecological values would exist in both modified and unmodified channels, portions of the unmodified channels are believed to be among the channels which provide some of the greatest ecological value overall. The majority of impacts to biological resources in unmodified channels would be eliminated, but some disturbance and impact to unmodified channels would be necessary to maintain human-made structures. Compared to the Proposed Project, the Limited Work Alternative may promote the ecological structure and function of unmodified reaches by reducing impacts to plant and animal species, riparian habitat, and wetlands. To the extent that maintenance activities would support or improve ecological structure and function (for instance, create conditions unfavorable to invasive exotic species), these benefits would not be realized to the same extent as under the Proposed Project.

Under the Limited Work Alternative, the overall amount of maintenance likely would be reduced. As a result, impacts related to aesthetics, air quality, biological resources, cultural resources, noise, recreation, traffic, geomorphology, and water quality would be reduced compared to the Proposed Project.

Sediment discharges from bank failures that would not be addressed under this alternative would result in a greater temporary reduction in conveyance capacity than under the Proposed Project, and they would have adverse water quality (sedimentation) impacts. In addition, because flood flow capacities would not be maintained in these unmodified channels, flood risk may increase in these reaches.

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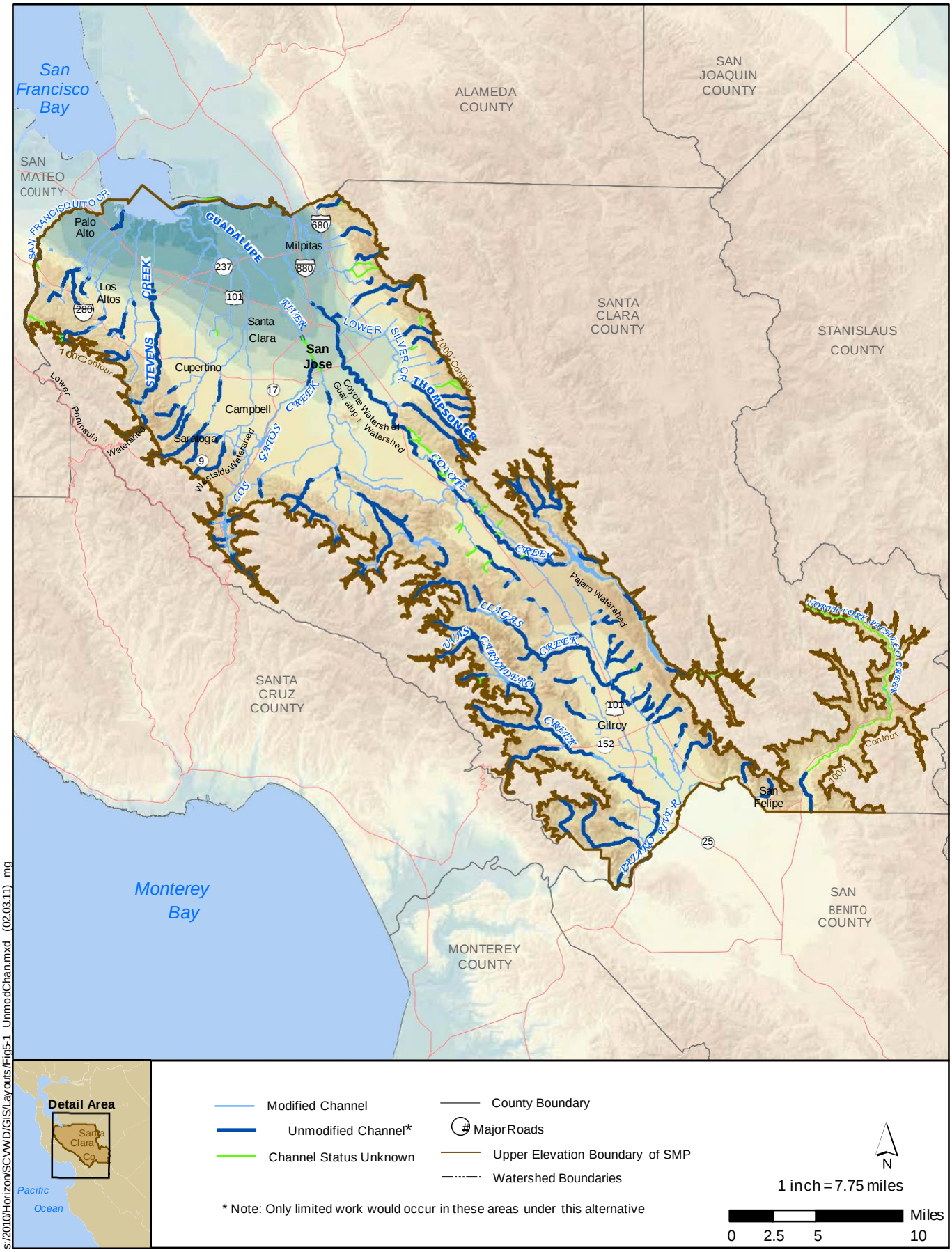

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Horizon WATER and ENVIRONMENT

Figure 5-1: Limited Work in Unmodified Channels Alternative

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5.4.4 Limited Activities Alternative

Characteristics of this Alternative

Under the Limited Activities Alternative, the five types of maintenance activities proposed in the Proposed Project would occur, except those maintenance activities with the greatest biological impacts would be eliminated or modified. For bank stabilization activities, no hardening of stream banks would be allowed and only "soft" stabilization measures would be used. For sediment removal activities, equipment always would be located at the top of the bank and would not be allowed in the stream channel. For vegetation management activities, no herbicide use would be allowed, and only mechanical vegetation management methods would be utilized. For management of animal conflicts, no rodenticide use would be allowed. Minor maintenance activities would be conducted as described under the Proposed Project.

The methods included in the Proposed Project currently are used by SCVWD because they are the most effective methods for accomplishing maintenance. Relying on alternative methods would result in increased effort to accomplish the same degree of necessary maintenance. Alternative methods also may result in higher implementation costs and/or less maintenance work getting accomplished each year.

Impact Analysis

Under the Limited Activities Alternative, avoidance of the most impactful activities would eliminate impacts but may increase others. For instance, eliminating the use of herbicides and rodenticides would reduce potential for impacts on water quality. However, repeated hand vegetation removal likely would result in greater trampling of vegetation/habitat than single events of herbicide application. Likewise, the growth of some species of undesirable vegetation may not be effectively controlled without the use of herbicides.

In addition, SCVWD would not always be able to complete needed maintenance by relying solely on the limited activities. For instance, conducting sediment removal from the top of the stream bank may not allow for removal of sediment from certain channels that could not be accessed from the top of the bank. Therefore, this alternative would be likely to impede sediment removal that would be necessary to maintain flood flow conveyance capacity. As a result, the potential flooding risk would increase at these locations.

Furthermore, reliance on alternative methods for implementing maintenance activities could result in new and/or increased environmental impacts, compared to the Proposed Project. For instance, relying solely on mechanical vegetation management as opposed to herbicides could result in greater noise and air quality impacts.

Finally, restricting bank stabilization to "soft" methods could result in inadequate bank protection in instances where hard methods are needed for bank stability. This could result in repeat bank failures, with adverse impacts on habitat and water quality through direct loss of riparian habitat as well as sediment discharges. The need for repeat bank repairs

could increase the impacts associated with such maintenance activities (e.g., increased air emissions, noise impacts).

5.5 Alternatives Considered and Dismissed

The following alternatives were considered but ultimately were dismissed from further analysis for one or more of the following reasons: (1) they were not substantively different from one of the considered alternatives; (2) they would not sufficiently meet the Proposed Project objectives; (3) they were determined to be infeasible; or (4) they would not avoid or substantially reduce one or more significant impacts of the Proposed Project:

- Geomorphic Alternative
- Watershed Approach Alternative
- Return to As-Built Conditions Alternative
- Modified Pajaro River Basin Alternative
- No Herbicides Alternative
- Reduced Extent Alternative
- Alternative Locations
- Reduced Time Frame Alternative

5.5.1 Geomorphic Alternative

This alternative would improve habitat complexity and function in Project Area streams by restoring geomorphic functions. Restoration of geomorphic functions would include allowing channel meander and sediment transport within Proposed Project streams, by widening stream rights-of-way, creating flood benches where flood flows could disperse, removing hardscape elements, and restoring more natural hydrographs to stream flows.

Although it is anticipated that this alternative would reduce individual maintenance activities in the SMP Update, it would involve implementation of new capital projects. Because it would focus on capital projects rather than maintenance, it would not meet the fundamental goal of the SMP Update as a maintenance program for current infrastructure.

Development of these new capital projects would result in substantial additional construction and costs (land, design, and construction) for SCVWD. In addition, along many streams, especially in the Valley floor areas, channels would be very narrow and development would have encroached to the edge of the right of way, making the acquisition of additional right of way to allow channel meandering or create flood plains very difficult and expensive, if not impossible. The capital improvements and associated operational changes could result in a variety of new environmental impacts that would need to be mitigated by measures outside of the scope of the BMPs included in the Proposed Project.

Because this alternative would not meet the project objective and would have limited feasibility, it was dismissed. However, SCVWD does engage in capital projects which are rooted in geomorphic design considerations, but such activities would be outside the scope of the SMP Update.

5.5.2 Watershed Approach Alternative

This alternative would attempt to reduce or eliminate the need for future sediment removal activities by using watershed management approaches to reduce sediment inputs to Proposed Project streams. To reduce sediment inputs, SCVWD would implement erosion control activities in the upper watersheds of Proposed Project streams. These erosion control activities could include bank stabilization, restoration or replanting of creek banks and surrounding lands, and installing fencing to exclude grazing animals from streams.

Although conceptually the watershed management approach should reduce the need for proposed sediment removal activities, this alternative would be unlikely to eliminate the need for future sediment removal. Because many Proposed Project streams would have confined channels, their capacity to transport or store sediment would be greatly diminished. Thus, to eliminate the need for sediment removal, upstream sediment inputs would need to be reduced to a very large extent (i.e., below pre-European settlement conditions). Furthermore, this alternative would not alleviate the need to conduct other aspects of the Proposed Project (i.e., bank stabilization, vegetation management, management of animal conflicts, and minor maintenance).

Finally, feasibility of this alternative may be limited because SCVWD would not necessarily own the land or have the necessary easements to conduct watershed-based sediment control. Overall, this alternative would have feasibility constraints and would not be likely to substantially reduce the scope of the Proposed Project or its related significant environmental impacts.

5.5.3 Return to As-Built Conditions

This alternative would maximize flood protection for residents by focusing solely on restoring design flow conveyance capacity rather than balancing flood protection needs with environmental needs. SCVWD would implement the SMP Update by focusing on restoring flood flow conveyance capacity, with minimal or no restrictions to protect biological or cultural resources. Sediment removal would be conducted in modified channels without regard for the presence of sensitive species or habitats and could occur as frequently as desired to maintain flood flow conveyance. Vegetation management would be conducted using the most cost effective methods, which likely would focus on herbicide use, tree removal, and removal of all vegetation from the channel.

This alternative would not meet the primary Proposed Project objective of incorporating stream stewardship principles into maintenance activities, to avoid, minimize, or mitigate impacts on the environment. Furthermore, it would be more challenging for SCVWD to obtain environmental permits from regulatory agencies because of the significant environmental impacts likely to be associated with this alternative, especially when less damaging alternatives existed, such as the Proposed Project.

5.5.4 Modified Pajaro River Basin Alternative

This alternative was considered in the 2002 SMP EIR, to reduce environmental impacts on biological resources by limiting herbicide use for vegetation management in the Pajaro River Basin. Because an alternative already existed which considered limiting herbicide use (the Limited Activities Alternative), this alternative was not considered further.

5.5.5 No Herbicides Alternative

This alternative would reduce environmental impacts on biological resources by excluding herbicide use for vegetation management in the Project Area. Because an alternative already existed which considered limiting herbicide use (the Limited Activities Alternative), this alternative was not considered further.

5.5.6 Reduced Extent Alternative

This alternative would preserve the structure and functions of certain areas of high biological value by prohibiting maintenance activities with potential for adverse impacts on stream reaches with sensitive habitats. Sensitive habitat is defined as that which supports endangered species. Streams are by their nature sensitive habitats, and a large portion of Project Area streams provide some sensitive habitat. As a result, in large sections of Project Area streams, the SCVWD would not be able to perform SMP Update activities needed to maintain flood flow conveyance capacity. Therefore, this alternative would not meet the basic Proposed Project goal/objective of maintaining the appropriate flood conveyance capacity of Project Area streams.

5.5.7 Alternative Locations

This alternative would reduce environmental impacts by conducting maintenance activities at locations where fewer sensitive environmental resources were located. Although the SMP Update activities could restore flood conveyance capacity in any reach where they were conducted, the Proposed Project specifically would target stream reaches where the design conveyance capacity had been reduced. Conducting these activities at unnecessary locations would not address the needs for maintenance activities in reaches where conveyance capacity had decreased. This alternative could increase flood conveyance capacity in reaches beyond the design capacity, resulting in a capital project and activities outside of the scope/intent of the SMP Update. This alternative would not meet the basic Proposed Project goal/objective of maintaining the appropriate flood conveyance capacity of Project Area streams.

5.5.8 Reduced Time Frame Alternative

This alternative would reduce environmental impacts by limiting sediment removal, instream vegetation management, herbicide application, and bank stabilization activities to the period from June 15 to October 15. The Proposed Project would allow these activities to occur from October 15 to December 31, as long as the weather remained dry. Because the No Project Alternative already considered limiting work to the period from June 15 to October 15, this alternative was not considered further.

5.6 Environmentally Superior Alternative

Weighing all issues, the Proposed Project is considered to be environmentally superior. Compared to any of the alternatives, it would strike the most appropriate balance among maintaining the design flow or appropriate conveyance capacity of facilities, protecting the ecological integrity of channels, and addressing other short- and long-term impacts associated with the proposed maintenance activities.

This fact notwithstanding, CEQA requires that an environmentally superior alternative be selected from among the alternatives to the Proposed Project. The Reduced Frequency Alternative is considered the environmentally superior alternative because by limiting the amount of all annual maintenance activities, it would reduce the impacts associated with these activities. However, this alternative would maintain the design flow or appropriate conveyance capacity of facilities to a lesser extent than the Proposed Project. Although flood flow capacity would be retained in the long term from conducting larger maintenance events, flood risk would increase in the interim because needed maintenance events would be delayed so that they occurred no more frequently than every 5 years.

The other alternatives were not selected as the environmentally superior alternative for the following reasons:

- ***No Project Alternative.*** Although this alternative would provide only a slight reduction in the maintenance of the design flow or appropriate conveyance capacity of facilities, maintenance would not necessarily be conducted in a timely manner to avoid flood hazards. Furthermore, maintenance activities may not be implemented along with a comprehensive mitigation approach and consistent set of BMPs. Therefore, flood risk would be greater and, at the same time, more residual impacts likely would remain.

- ***Limited Work Alternative.*** As a result of reduced maintenance activities in unmodified reaches, this alternative would promote the ecological structure and function of these reaches and, therefore, would reduce a variety of impacts related to the Proposed Project in those locations. However, this alternative would result in increased flood risk along unmodified channels and resulting impacts on downstream creek systems.

- ***Limited Activities Alternative.*** This alternative would slightly reduce impacts to biological resources. However, new/increased impacts also could result from the use of alternative maintenance methods. This alternative also could result in a reduction in the maintenance of the design flow or appropriate conveyance capacity of facilities at locations where sediment removal could not occur solely from the top of the bank, and increased water quality and habitat impacts where soft bank stabilization methods were not effective.

Chapter 6
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Chapter 7
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Chapter 5 Alternatives Analysis

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